AVIATION

The Oldest American Aeronautical Magazine

AUGUST 4, 1928 | Issued Weekly | PRICE 20 CENTS

Formation of British "Fairey-Napier" Observation Planes at the R. A. F. Display

VOLUME XXV

NUMBER 6

Special Features

The National Air Tour

The National Air Races

Modern Management and the Industry

AVIATION PUBLISHING CORPORATION
250 WEST 57TH STREET, NEW YORK

Application for transfer of second class entry from Highland, N. Y., to New York, N. Y., is pending
Yearly subscription rates: Domestic $4, Canada $5, all other countries $6.

AVIATION

The Oldest American Aeronautical Magazine

EARL D. OSBORN, *Publisher* — R. SIDNEY BOWEN JR., *Editor*
LESTER D. GARDNER, *Director* — HERBERT F. POWELL, *News Editor*
GEORGE NEWBOLD, *Business Manager* — DAVID J. LEISK, *Art Editor*
ALBERT F. MULLADY, *Asst. Business Manager*

Vol. XXV — *August* 4, 1928 — No. 5

Index to Contents

AVIATION PUBLISHING CORPORATION
Business and Editorial Offices
250 West 57th Street, New York City
Cable Address: AEROENG

Publication Office New York, New York

Subscription price: Four dollars per year. Canada, five dollars. Foreign, six dollars. Single current copies twenty cents. Back numbers 25 cents. Advertising rates on application. Issued every Saturday. Forms close eight days previously. Application for transfer of second class entry from Highland, N. Y., to New York, N. Y., is pending.

For Your Convenience in Subscribing

Please send AVIATION to

.....

.....

.....

Enlosed find check ( ) money order ( ) for $....

AVIATION

The Oldest American Aeronautical Magazine

Vol. XXV *AUGUST 4, 1928* No. 6

Propeller Accidents

TWO PROMINENT people were recently seriously injured by stepping into the path of propellers while engines were being idled. In both cases the planes were multi-engined cabin planes but such accidents can also occur with single engined planes. Unfortunately no safeguard has been devised and it is improbable that any safeguard can be devised which will make a whirling propeller fool proof. The danger will have to be avoided by constant attention and vigilance on the part of the personnel of the plane, and of the public. It will take a long time before the public realizes the invisible danger which can cause such instant destruction. In fact it will always be up to the personnel of the field to see that the passengers exercise proper caution.

Especially in multi-engined planes, either fixed guards, or the stationing of men to warn people away from the propellers, is almost an essential requirement. If no guards are available a good rule is to keep the passengers in the cabin until the engines can be stopped. In loading passengers into multi-engined planes it has been a practice in Europe to warm up the engines in the hangar or away from the loading ramp. Such a practice is advantageous in that it prevents the passengers witnessing the mechanics tinkering with the engines and also it makes loading safer. Cartoons such as are used by insurance companies to reduce industrial accidents might also be of value in keeping before the public's mind the constant necessity of remembering that propellers are dangerous.

Advanced Training

THE AUGUST issue of the Alexander Aircrafter, the house organ of the Alexander Aircraft Co., contains two good suggestions as to how flight training can be stimulated through Federal aid. The first of these is through greater training activity at every Army, Navy and National Guard air post. The second is through legislation which will permit the Army and Navy to pay properly accredited private schools to furnish primary training for future military cadets.

It may seem strange to those who are not intimately aware of the present situation that a prominent manufacturer of planes should ask for an increase of Federal aid at a time when flying schools are flourishing all over the country. When it is considered that many of the manufacturers' planes are used for civilian training and none in military training the appeal for an increase in Federal stimulation of flying appears even more strange. The truth is, however, that much as we dislike to admit it the advanced training situation in this country is not satisfactory. To get a Federal license permitting the carrying of passengers for hire a pilot must have 200 hr. in the air. Even with the most economical equipment this is expensive and the average student has not even yet become reconciled to the cost of obtaining a limited commercial license which requires 50 hr. solo time.

In times past most of the fliers got their training at the expense of the Government. A few, quite a few in fact, got their experience at the cost of their passengers under conditions which were not to be tolerated. At present the barn storming method of learning to fly is rapidly being closed down and there should be increased Government facilities for the training of men who wish to make piloting their career. Soloing and the instruction of private plane owners can be adequately handled by private schools but when it comes to running up the mileage necessary to get experience under all conditions the investment is too great for the purse of the average man who wishes to make piloting a career.

All Orders by Wire

AN INTERESTING side-light on the present hectic state of the aircraft industry is shown in a report from an accessory company. Its product has been on the market for some time and has been widely advertised, yet in spite of this every one of the twenty odd sales which the company has made this year has been placed by a telegraphic order. The orders averaged over a thousand dollars a piece, but once having made up their minds to the purchase, the operators and owners of the aircraft to which the accessory was to be fitted were so impatient that they could not wait the extra day or so that a letter would take, and instead placed their order by wire.

The experience of the company referred to could probably be duplicated by many other concerns, and it is significant not only as being indicative of lack of planning by aircraft operators, but also because it shows the methods which must be adopted by sales organizations. Ordering by telegraph or air mail is certainly following American business methods, but if aircraft operators really planned out the schedule of their work it would not be probable that twenty out of twenty orders would be placed by telegraph. If further proof were needed of the lack of matured plans, this brief dispatch would be sufficient.

Until the operation of aircraft becomes more settled, however, such conditions will continue to exist, and the salesman of aircraft materials must realize that decisions are quickly made. Where time is lost the order often goes to a competitor. Those who are accustomed to work in more settled fields must find it hard to realize the methods prevalent in the aircraft field.

The National Air Races

Well Arranged Program Includes Trans-Continental, International and Closed Course Races and an Aeronautical Exposition

PRIZES totaling more than $200,000 will be awarded the winners of the 1928 National Air Races to be held at Mines Field, Los Angeles, Calif., in conjunction with the Aeronautical Exposition, September 8-16 inclusive. This amount is three times greater than any previously offered, say officials of the California Air Race Association, sponsor of the met which is sanctioned by the N. A. A.

The prizes will be awarded to the place winners in transcontinental races from New York to Los Angeles, the Pan-American, the Canadian and the California derbies and the special events and closed course races, which will feature the nine-day meet. The California race association has offered $125,000 in cash prizes, it has been announced. In addition, the 17 cities through which the pilots entered in the New York to Los Angeles derbies, must fly, have offered cash prizes for the various laps as well as trophies.

The remainder of the awards consist of cash prizes and trophies contributed by both individuals and business houses, who are interested in advancing the cause of aviation. Miss Elizabeth C. P. Miller, aviation enthusiast of Cleveland, O., has signified her intention of offering $5,000 in cash and a silver trophy, which are to be used as special awards in the transcontinental air races. These donations place Miss Miller at the head of the list of individual contributors, officials of the association say.

The cities that have contributed prizes for the transcontinental races are Harrisburg and McKeesport, Pa.; Columbus, O.; Terre Haute, Ind.; St. Louis and Kansas City, Mo.; Wichita, Kan., Oklahoma City, Okla; Ft. Worth, Abilene, Midland, Pecos and El Paso, Tex.; Lordsburg, N. M.; Tucson and Yuma, Ariz.; and Los Angeles.

Map showing the routes of the trans-continental and international races.

The largest amount in prize money and trophies will go to the winners of a free-for-all non-stop flight from New York to Los Angeles. Prizes totaling $22,500 will be awarded the winners in this event. Cash prizes and trophies valued at $40,000 will be distributed among the winners of three other New York to Los Angeles races. These three races are for three classes of planes and civilian flyers only will be allowed to enter. The Canadian derby from Windsor, Can., to Los Angeles will bring the winners $10,000 in cash and trophies, as will the Pan-American derby starting at Mexico City, Mex.

The Executive Committee of the California Air Race Association

Top row, left to right: D. B. McDaniel, president Southern California Chapter of the N. A. A.; Theodore T. Hull, president of the American Aircraft Corp.; Harry H. Wetzel, vice-president of the Douglas Aircraft Corp. Lower row, left to right: Dudley M. Steele, manager Aviation Dept., Richfield Oil Co.; Dr. T. C. Young, director of California Development Assn.; Robert J. Pritchard, editor WESTERN FLYING, *and Cliff Henderson, managing director of the air races and the exposition.*

Two races from the San Francisco Bay region, airline distance events, speed races around pylons, pursuit races, parachute jumping contests, special events for Army, Navy and National Guard aviators, air line distance races and endurance record contests are some of the other events that are planned. One hundred and twenty-five thousand dollars in cash prizes will be awarded for these and other contests.

Fifteen hundred planes are expected to participate in the National Air Races this year. This estimate by air race officials is based upon the 3,500 requests for entry blanks that have been received already. More than 5,000 pilots and technicians are likewise expected to compete. This interest which is being displayed in the air races is also reflected in the

Aeronautical Exposition, which will be held at the time of the races. The exposition is likewise sponsored by the California Race Association.

The original plans for the exposition building, which is now under construction on a site adjoining Mines Field, were altered to provide 40,000 more square feet of floor space, so great has the influx of reservations for display space been, it has just been announced by Cliff Henderson, managing director of the 1928 National Air Races and the Aeronautical Exposition. Under the altered plans, the building will contain 200,000 square feet of floor space. It is to be 500 ft. in length and 400 ft. in width.

Plow Hitched to an F-10

Ground was broken for the exposition building three days before the planes on the 1928 Ford Reliability Tour arrived at Mines Field. Disregarding the usual spade, the ceremony was conducted with the use of a plow hitched to the tail of a Fokker monoplane. Dr. T. C. Young of Glendale, director of the California Development Assn., and a pioneer in aviation development in the West, who is a member of the executive committee for the 1928 air races and the exposition, guided the plow as the plane taxied across the field. Dick Ferris, another pioneer of aviation in the West, who staged Southern California's first aviation meet in 1911, was among the honored guests on this occasion.

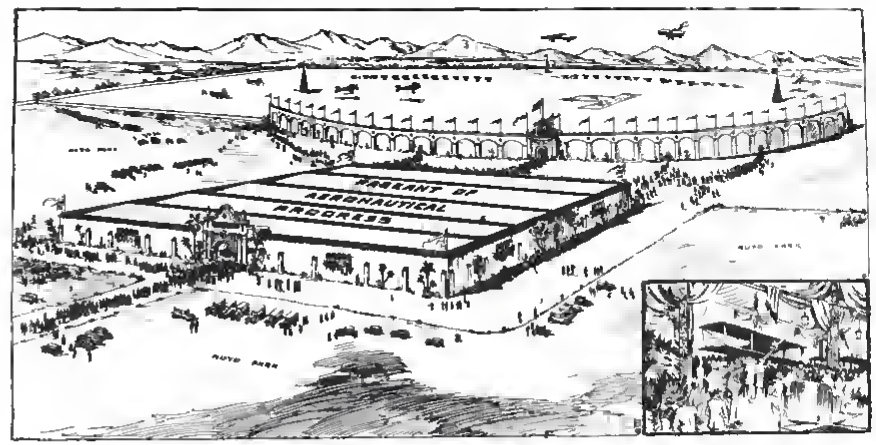
Among those who have already reserved space for exhibits during the exposition are the Westinghouse Electric Co., the Wright Aeronautical Corp., the Irving Airchute Co., the Eclipse Manufacturing Co., A. G. Spaulding and Co., the Cleveland Pneumatic Tool Co., the Gordon and Ferguson Co., the Timken Roller Bearing Co., the Douglas Co., the Advance Aircraft Co., Fairchild Aviation Corp. and Subsidiaries, the Curtis-Robertson Co., the Federal Aircraft Co., the Lockhead Co. and the Kinner Airplane and Motor Corp.

A number of oil companies have also reserved space. Among them are the Richfield Oil Co., the Associated Oil Co., the Standard Oil Co., the Union Oil Co., the Shell Oil Co. and the Texaco Oil Co. Space is also being provided for several exhibits by manufacturers of articles in fields foreign to the aeronautical industry as the results of their urgent requests.

To govern exhibits at the exposition, the race association has evloved a set of rules telling of the character of the displays that may be shown, the various departments, fees, allotment of space, the shipment and receipt of goods, installation of exhibits, removal of goods, the care of spaces, information concerning passes insurance, registration and power. This information is contained in the application blanks for space at the exposition, which are issued by the association, and may be obtained by writing to the California AirRace Association.

(*Continued on page 424*)

Dr. T. C. Young handling a plow hitched to a Fokker F-10 and breaking ground at Mines Field, Inglewood, near Los Angeles, Calif.



An architect's sketch showing Mines Field, Los Angeles, as it will appear for the National Air Races. Lower right, a section of the exposition building.

Modern Management *and the* Industry

By Edwin R. Douglas
Consulting Engineer

DURING his life the human being passes through the stages of infancy, adolescence, maturity, old age, each well defined, and each terminated by a period of critical change. This seems to be true, likewise, of all human institutions and inventions. The automobile industry, in thirty years, has passed through these stages to seeming maturity. The airplane is started on the same course. At this time the airplane industry is passing from childhood to adolescence, from the experimental and amateur stage of limited hand building to intensive, well-planned, fast-growing production. Optimists are prophesying for it as great things as have befallen its predecessor—or greater! What, then, may this infant learn from the history of its older brother?

In twenty or thirty years the airplane industry will doubtless be wide-spread, well-standardized, settled, but at this moment of youth it is plastic to receive any form impressed on it. Not merely is the time opportune, it is pregnant, for in the next two or three years there will be fixed the trend that will determine the future for most of those concerns and individuals now in this field. Along the way of the automobile, how many are the names, once well-known, now fading in memory or forgotten! How few are still on the course, who started a quarter-century ago! Survival of the fittest? Yes, survival of those who by foresight, courage and energy prepared the way for their Visions to become Realities. Likewise, those airplane and engine builders who, having measurably solved the questions of experiment and design, shall now best anticipate the future, provide the foundation for capital, mould their organizations in the forms of economy and efficiency—these are the ones who will be strong on the course, whose names will be known, twenty and thirty years from now. Those who do these things less well are the ones who will drop by the way and be forgotten.

What, then, shall the individual builder do, now, to prepare for this future? What more than he has, and is, does he need to have, and be? In candor it must be admitted that the men who are now producing airplanes are, with few exceptions, untrained in the organization and administration of large industries. They are flying men rather than production men, their minds and hearts are in the air, and in wing-sections and stress calculations, rather than in manufacturing-schedules, stock-minimums, and production-quotas. This was necessary and well for a while, but the time is now arrived when the latter questions must receive full consideration. Though not forgetting his heaven-learned ideals, the forward-looking airplane builder must open his heart and train his mind and his organization to ways which, though by comparison sordid and earth-bound, are vital for the growth and continuance of his industry.

Production, Costs and Profits

It is the desire of every business executive to carry on his operations in peace and security, to conserve his capital, to promote the welfare of his employees, to satisfy his customers, and to make a respectable profit. The last is the focus of all the others. The attainment of these diverse objectives, from the first to the last, rests on an underlying something vaguely called good management. It has been, in the past, a sort of heaven-sent gift, which most men lacked, in which a few excelled. This, to a considerable extent, it always will be, but some of its principles have in late years been uncovered. The application of these principles in American industry during the last two decades has led to tremendous advances, to the more general attainment of all those objectives named above, and to American supremacy in many lines.

Through these principles runs a common element which it will be the purpose of these articles to examine. This element is exact, centralized knowledge. Modern management is founded on this, on the exact knowledge of what is to be done, how it is to be done, by whom it is to be done, when it is to be done, and, finally, that it is so done. Let us, then, enquire through what channels this specialized knowledge has been applied to the attainment of these business objectives and the increase of profits.

Profit or loss in any transaction is the difference between the cost of the commodity and the price at which it sells. To be a true index, this figure must include every element which contributes to the actual result. These elements are

(*Continued on page 434*)

E. R. Douglas

By virtue of his training and actual experience Mr. Douglas is well qualified to write of the problems that exist in the airplane factory. Following his graduation from Stevens Technology Institute with an M. E. degree, Mr. Douglas did post graduate work in physics and mathematics at Harvard and obtained the degree of Sc. M. He then became designing engineer of the Crocker Wheeler Electric Co. and following that connection served as superintendent and works manager of manufacturing concerns engaged in sheet metal drawing and stamping, and foundry machine and wood working.

He later acted as a consulting engineer, specializing in organization, production and costs. At one time he served on the Standardization Committee of the S. A. E. One of his recent connections was that of consulting engineer for the Kreider-Reisner Aircraft Co., Inc.

The Repair *of* Damaged Fuselage Members

By C. L. Ofenstein
Chief, Engineering Section, Aeronautics Branch, Department of Commerce

At the present time when practically all airplanes being built have welded tubular steel fuselages, the questions "what shall I do when I have a buckled fuselage tube?" and, "how shall I repair or replace a broken fuselage tube?" are frequently asked. Since a part of the repair work will be done with the oxy-acetylene torch, a brief description of the welding process is herewith given.

The welding of steel tubes consists in heating the two adjoining ends to a white heat, about 2200 deg. F., and while at this temperature fusing the metal of the welding wire with the metal of the joint ends until the joint is filled. This requires considerably more experience and skill than is believed by a great many people. Since the melting point of steel is approximately 2500 deg. F., the welder is working within a few hundred degrees of this most of the time. Every degree of heat over 1600 deg. applied to steel may be injurious to it because it burns out the carbon, thus reducing the strength of the steel. This may proceed to a point where most of the carbon has been removed, in which case the strength of the steel has been reduced to a dangerous value. When a welded joint is heated to too high a temperature it usually presents a porous appearance. The burning out of the carbon is indicated by sparks flying from the joint. Since the temperature of the joint is judged solely by the color, the following table is given, the temperatures being in degrees Fahrenheit:

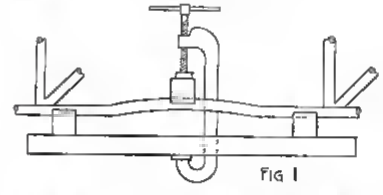


Fig 1

1100°—Dark Red
1200°—Cherry
1500°—Bright Red
1700°—Orange
1800°—Lemon
2000°—Light Yellow
2200°—White

The joint itself is usually not as strong as the tubes were before welding because it is a cast structure. The material adjacent to the weld for approximately an inch on either side is also weakened because it is annealed. The tensile strength of a joint should not be calculated for more than 80 per cent. of that of the tubes.

Certain members, due to their method of manufacture should not be welded. These are (1) members which depend on cold working for their strength such as stream line wires; (2) members which depend on heat treatment for their strength such as bolts and many types of axles and (3) brazed joints, because the brazing material will penetrate the fused steel and weaken it.

If a fuselage tube is buckled or bent and is not cracked or split it may be straightened quite easily. After it has been straightened, the straightened part will be stronger than it was originally because of the cold work done on it. A steel screw "D" clamp, three blocks of hardwood and a long piece of wood stronger than the tube in bending, are required. The blocks should be made by boring a hole, the diameter of the tube, through large blocks and then sawing them in half. The arrangement is shown in the sketch Fig. 1.

If the tube has a small local failure such as a dent, it should be repaired by placing two blocks, made as before described, directly over the dent. Pressure applied to the blocks by means of the steel "D" clamp will restore the tube to its correct shape.

It should be remembered that a bent or dented fuselage tube which takes compression is practically worthless since it has lost most of its strength as a column.

In the event that a tube is bent and split it may either be straightened or cut out. If it is straightened and allowed to remain in use it should be reenforced by a tube of larger diameter which has been sawed in two lengthways, placed around it and welded in position. The ends of the reenforcing tube should be as close to the ends of the damaged member as permissible without the possibility of injuring the end fittings during the welding operation.

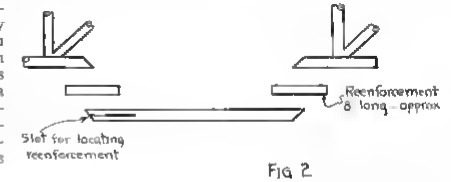


Fig 2

If the tube is split and is cut out, or is broken and cut out, it may be replaced by two methods (1) by the use of a tube of the same size and with internal reenforcements, (Fig. 2), or (2) by the use of a larger tube, slipped over

(*Continued on page 430*)

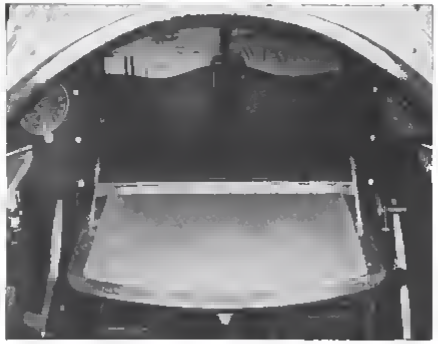
The New "Corsair"

Special Plane Built for Assistant Secretary Warner Has Many Novel Features Including a Folding Desk

THE new "Corsair" biplane recently delivered by the Chance Vought Corp., of Long Island City, N. Y., to Hon. Edward P. Warner, assistant secretary of the Navy for aeronautics, is probably the first "flying office" in the country. A folding desk, compartments for reading and writing materials and other necessities for conducting business are installed in the after cockpit making it possible for Secretary Warner to attend to many of his official duties while flying from place to place.

Delivery of Assistant Secretary Warner's plane is part of a contract for 135 Corsairs which are now being produced for the U. S. Naval and Marine Corps Air Service by the Vought Corporation. Like the production planes it is powered with a Pratt & Whitney Wasp engine developing 400 hpp at 1900 r. p. m. The Vought Company was the first to adopt air cooled engines for its planes and the Corsair has been designed around the Wasp engine. It may be said that both plane and engine were designed for each other because of the close co-operation of the two companies in the development of airplane projects.

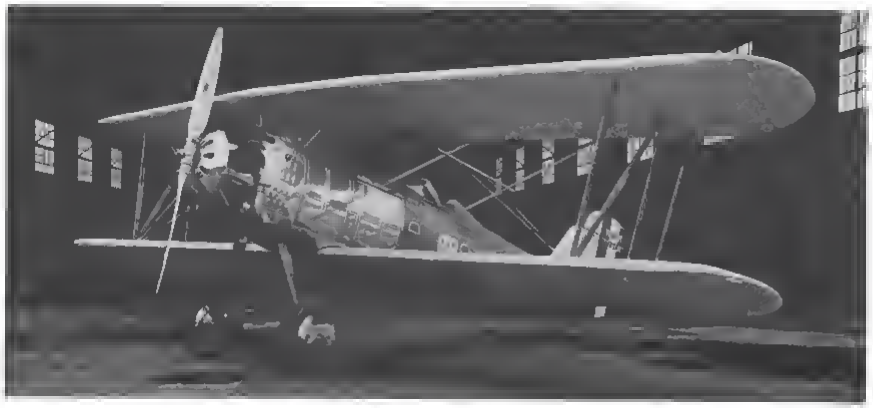
Excepting the landing gear, which is interchangeable, the new plane is practically a duplicate of the standard Vought Corsair seaplane which holds four world records for speed. It is however, specially finished and equipped and in appearance is probably one of the most beautiful planes in the country. Fuselage, struts and landing gear are finished in blue and wings in natural cream color. Side fuel tanks, engine cowling and landing gear wheels are of polished aluminum. On the side of the fuselage the Secretary's insignia, consisting of anchor and four stars in blue on a white background has been inserted.



View of the desk fitted in Assistant Secretary Warner's "Corsair"

The desk is built in the forward portion of the rear cockpit and when opened provides ample space for writing. A compartment in the rear of the desk is used for stationary, letters and periodicals and a leather pen and pencil case in the center is also provided. The writing

(*Continued on page* 434)



Front quarter view of Assistant Secretary Warner's Vought "Corsair"

Performance Calculation *and* Slipstream Effect

By J. M. GWINN, JR.
Consolidated Aircraft Corp

THE conventional method of allowing for the increase in parasite drag due to slipstream, viz., calculating the slipstream velocity and increasing the drag of parts in it accordingly, is a tedious process. It must be repeated for every speed and altitude and if calculated for climbing condition, i.e., wide open throttle, the resulting power required curves are incorrect for calculations of flight conditions other than full throttle. Furthermore, if the propeller characteristics are changed the power required curves must be corrected for the change in slipstream.

The method used by some, of having a general efficiency curve for propellers, which curve, derived from flight tests, includes decrease in effective thrust due to increased drag from the slipstream is much simpler, but is inflexible and does not give the designer an opportunity to determine the effect on performance of changing the propeller characteristics.

Allows Plotting of Power Required

A method of slipstream correction that is approximately theoretically correct, and which is applied to the power available curve rather than the power required curve is derived. This correction allows the plotting of power required without slipstream correction, which curve is correct for use with any propeller or engine powe. The power available at various speeds is then calculated from the propeller characteristics, and the values obtained multiplied by the factor b.

Where $B = 1 - \frac{.93aK}{A}$

A = the propeller disc area in sq. ft

a = the fraction of the total parasite drag including wing section drag which is in the peopeller slipstream. This fraction varies slightly for a given propeller with variations in speed but the error entailed in assuming it constant is far less than the error in the assumptions of parasite drag co-efficients and interference.

K = the parasite drag of the airplane at one mile per hour in air of a density of 32.2#/cu. ft

$= (\frac{W}{S})^2 \frac{125}{V^2}$ for monoplanes and

$= (\frac{W}{S})^2 \frac{125}{1.27V^2}$ for average biplanes

Where W = weight of airplane

S = span of wing (average span for biplanes)

D_p = parasite drag of airplane in pounds

T_c = thrust required for climb in pounds

C = rate of climb in feet/min

$T_c = \frac{CW}{88V}$

(2) Total drag = Thrust = $D_i + D_p + T_c$

$D_p = K_p [a V_c^2 + (1 - a)V^2]$

Substitute (1) for V_c^2

$D_p = K_p (\frac{2aT}{2151A} + V^2)$

Substituting in (2)

$T = D_i + \frac{2aT\ K}{2151A} + K V^2 + T_c$

Solving for T

$$T = \frac{D_i + K V^2 + T_c}{1 - \frac{2aK}{2151A}}$$

Multiplying thru by $\frac{V}{375}$ converts this to power

$$(3)\ \frac{TV}{375} = \frac{\frac{D_iV}{375} + \frac{K V^3}{375} + \frac{T_cV}{375}}{B}$$

Where $B = 1 - \frac{2aK}{2151A} = 1 - \frac{.93aK}{A}$

The left hand side of (3) is power required for flight, P_{req}.

The first term of the numerator of the right side is induced horse power, P_i, the second term parasite horse power P_p and the third term power available for climb P_c all calculated without slipstream effect.

(3) then may be written

Let P_{av} = Power available from propellor

$$P_{req} = \frac{P_i + P_p + P_c}{B}$$

$P_{av} = P_{req}$ when P_{req} includes power for climb

$$P_{av} = \frac{P_i + P_p + P_c}{B}$$

Multiplying thru by B

(*Continued on page* 432)

The National Air Tour

John P. Wood Pilots a Whirlwind Powered Waco 10 to First Place With a Total Score of 27,013.4 Points

By JOHN T. NEVILL
AVIATION *Representative with the Tour*

PUSHED by the tail winds that have helped them around the major portion of an arduous route of approximately 6,500 mi, 26 airplanes comprising the 1928 National Air Tour, landed on Ford Airport, Detroit, Saturday afternoon, July 28 With excellent records indelibly demonstrating the reliability of American aircraft, 24 of the 25 competing craft, all of which took off from Ford Airport June 30, successfully negotiated the trying flight and came to rest at their destination at the appointed time One among the 25 dropped out of the contest in Oklahoma, after the pilot had experienced difficulty in obtaining parts for his Americanized foreign engine. Through the courtesy of the War Department, two Army planes, a Curtiss "Falcon," flown by Capt Gale Breen, and a tri-motored Fokker, piloted by Lieut Frank B. Tyndall, accompanied the commercial entrants

Held Lead From the Start

With a total of 27,013.4 points for airplane efficiency and reliability, John Paul Wood, of Wausau, Wis, flying a Waco 10 biplane, powered by a Wright J5 engine, was declared winner of the tour classic Wood took the lead on the first of the 32 legs included in the Tour route, and never lost it. As victor in the event he was awarded the Edsel B Ford airplane reliability trophy, annually presented to the Tour winner, and $2,500 as the first of 10 cash prizes awarded by the Detroit Board of Commerce, sponsors of the Tour Presentation of the trophy was made by William B Mayo, chief engineer of the Ford Motor Co at a "trophy dinner" held at the Hotel Statler on the night of the finish

Other prize winners in the event were as follows:

Position	Plane	Pilot	Score	Prize
Second	Ford	Frank M Hawks	24,398.8	$2,000
Third	Stinson Jr.	Randolph Page	22,986.5	1,750
Fourth	Waco	Charles W Meyers	22,127.1	1,500
Fifth	Stinson	Eddie Stinson	21,243.0	1,250
Sixth	Stinson	Bruce Braun	19,871.3	1,000
Seventh	Ryan B-1	Al Henley	19,728.9	750
Eighth	Bellanca	William S Brock	19,445.3	550
Ninth	Ryan B-1	Vance Breese	18,380.8	400
Tenth	Buhl	Louis G Meister	17,948.1	300

In addition, the Board of Commerce awarded $200 to every pilot completing the Tour and not listed among the first ten winners

Prizes totalling $3,750 were offered by Reid, Murdoch & Co of Chicago, A. C Spark Plug Co, of Flint, and the Chamber of Commerce of Wausau, Wis, one of the tour stops The Reid, Murdoch prize, $1,000 in cash, went to Wood, high scorer in the classic The A C Spark Plug Co. offered three cash prizes to the first three winners in the Tour, providing those winners used A C plugs throughout the Tour Wood was disqualified for the first prize, one of $1,000, because his engine was equipped with B G plugs, instead of A C Frank Hawks and Randy Page, second and third winners, were awarded $500 and $250, respectively, by the A C Company

Jack Atkinson, of Gary, Ind, pilot of Monocoupe, number 29, was presented with a check for $1,000 awarded by residents of Wausau, as winner of the "Air Mayor of Wausau" contest This prize went to the pilot who accumulated the most votes for leg flights during the Tour Ballots, containing votes numbering from 10 to 1,000, were given the pilots for each flight over the route. During the early part of the Tour through a misunderstanding, ballots were given for each passenger flight over legs or from airports visited on the Tour.

Scores of the remaining 14 contestants, upon completion of the Tour, were as folows:

Pilot	Plane	Number	Score	Motor
Lee Schoenhair	Lockheed	23	17,596.6	Wright J5 c
R W Fence	Fairchild	24	15,974.5	Wright J5
J H Kelly	Travel Air	3	15,700.2	Fairchild Caminez
George Haldeman	Bellanca	25	15,088.8	Wright J5
M V Aavang	Swallow	17	13,604.8	Wright J5 aB
Alger Graham	Buhl	7	13,528.2	Wright J5
Dave P. Levy	Stearman	6	12,700.8	Wright J5 aB
Cloyd Clevenger	Eagle Rock	12	11,477.7	Hisso "E"
Jack Atkinson	Monocoupe	29	8,370.4	Velie M5
E W Cleveland	Ryan	9	8,169.4	Wright J5 c
M Gould Beard	Waco	28	7,850.6	Fairchild-Caminez
George B. Peck	Travel Air	14	6,715.4	Ryan-Siemens (9)
Dan Robertson	Curtiss Robin	5	5,949.9	OX 5
Phoebe F Omlie	Monocoupe	26	5,523	Velie M5

One outstanding feature of the 1928 Tour was that Mrs Phoebe Fairgrave Omlie, of Memphis, Tenn., in completing the difficult route, had accomplished the longest flight ever flown in this country by man or woman, using a plane of that class. With the exception of one leg, from Marfa, Tex, to El Paso, during which she was a passenger in the Ford flown by Hawks, Mrs Omlie piloted her tiny plane over the entire course

A detailed account of the last nine legs of the Tour follows

Two planes that were left behind on preceding hops caught up with the tour at Great Falls, again bringing the total number of competing craft to 24 One of these pilots, George B. Peck, of entry number 14, a Travel Air, powered by a Ryan-Siemens 9, had been left behind in El Paso, Texas, 11 days before, when his engine developed magneto trouble. The other man to rejoin the tour was Jack Atkinson, pilot of Monocoupe number 29, who had delayed his departure from Portland because of illness Both Peck and Atkinson had checked in their planes at the various leg stops, leaving them in the competition for the Tour prizes. With the arrival of Atkinson and Peck only one of the 25 planes that left Detroit June 30 was out of the contest. Atkinson and Peck landed on the Vance Airport at Great Falls late Saturday afternoon, in plenty of time to take off with the rest of the planes the following morning

The tour planes began the 24th leg of the cruise on Sunday morning, July 22 Two legs, totalling 472 mi comprised the day's flying The first, a 326 mi hop to Froid, Mont, was made in the forenoon Every one of the pilots made perfect scores on that leg

On the preceding day's flying the touring planes, winging their way from Missouli, Mont., to Great Falls, had crossed the Rockies, leaving behind them the last of the hundreds of miles of mountainous country successfully

John P. Wood in front of his Whirlwind powered Waco 10

negotiated since the Tour struck its first mountains in West Texas Now, well on their way on the "home stretch" and toward the end of the long aerial trek they were over the rolling farm lands and plains of the eastern Northwest. With the passing of the mountains and deserts, section lines again became the pilots' aid to navigation

To Froid, a little town of but 500 persons, goes the gilded banner for the excellent way it handled the Tour visit Despite the population of the town, approximately 12,000 persons were present on Schnitzler Field Local committeemen stated they had flocked into town from more than 200 mi. around to witness the arrival and de-

(*Continued on page* 422)

EQUIPMENT AND MATERIALS USED BY NATIONAL AIR TOUR PLANES

Plane No.	Plane Model	Make of Engine	Manufacturer	Propeller	Magneto	Spark Plugs	Carburetor
1	Bellanca C. H	Wright J-5 CA	Bellanca Aircraft Co.	Hamilton Metal	2 Scintilla	AC	Stromberg
2	Ford Trimotored 4-AT	Wright J 5	Stout Metal Airplane Co.	3 Standard Steels	2 Scintilla	AC	Stromberg
3	Travel Air 6000	Fairchild Caminez	Travel Air Manufacturing Co.	Hartzel Wooden	2 Scintilla	BG	Stromberg
5	Curtiss "Robin"	Curtiss OX-5	Curtiss Aeroplane and Motor Co., Inc.	Jacuzzi	Berling	Champion	Zenith
6	Stearman C-3B	Wright J 5 AB	Stearman Aircraft Co.	Standard Steel	2 Scintilla	BG	Stromberg
7	Buhl "Airster" CA-3	Wright J 5	Buhl Aircraft Co.	Hamilton Metal	2 Scintilla	AC	Stromberg
8	Buhl "Airsedan" CA-3C	Wright J-5	Buhl Aircraft Co.	Standard Steel	2 Scintilla	AC	Stromberg
9	Ryan Brougham B-1	Wright J-5-C	Mahoney Aircraft Co.	Standard Steel	2 Scintilla	BG	Stromberg
10	Ryan Brougham B 1	Wright J 5	Mahoney Aircraft Co.	Hamilton Wooden	2 Scintilla	AC	Stromberg
11	Challenger C-3	Fairchild Caminez	Kreider Reisner Aircraft Co.				
12	Eaglerock Hispano	Hispano Suiza "E"	Alexander Aircraft Co	Hamilton Wooden	2 Dixies	Mosler	Stromberg
16	Ryan Brougham B-1	Wright J 5	Mahoney Aircraft Co	Hamilton Metal	2 Scintilla	AC	Stromberg
17	Swallow J-5	Wright J-5 AB	Swallow Airplane Co.	Hamilton Steel	2 Scintilla	AC	Stromberg
18	Waco 10	Wright J 5	Advance Aircraft Co.	Hamilton Metal	2 Scintilla	BG	Stromberg
19	Waco 10	Wright J 5	Advance Aircraft Co.	Hamilton Metal	2 Scintilla	BG	Stromberg
20	Stinson Detroiter SM 1D	Wright J-5C 1 B	Stinson Aircraft Corp	Hamilton Metal	2 Scintilla	AC	Stromberg
21	Stinson Detroiter Jr SM 2	Warner	Stinson Aircraft Corp.	Flottorp	2 Scintilla	AC	Stromberg
22	Stinson Detroiter Jr SM 2	Warner	Stinson Aircraft Corp.	Hamilton Metal	2 Scintilla	AC	Stromberg
23	Lockheed "Vega"	Wright J 5C	Lockheed Aircraft Co.	Hamilton Metal	2 Scintilla	AC	Stromberg
24	Fairchild FC 2	Wright J 5	Fairchild Airplane Mfg Corp	Hamilton Metal	2 Scintilla	AC	Stromberg
25	Bellanca C. H	Wright J-5 CA	Bellanca Aircraft Co.	Hamilton Metal	2 Scintilla	AC	Stromberg
26	Monocoupe 2-place	Velie M 5	Mono-Aircraft, Inc.	Hamilton Metal	2 Scintilla	AC	Zenith
28	Waco	Wright J 5	Advance Aircraft Co.	Hartzel Wooden	2 Scintilla	BG	Stromberg
29	Monocoupe	Velie	Mono Aircraft, Inc.	Hartzel Wooden			

Instruments	Starter	Wheels	Shock Absorbers	Brakes	Tires	Covering	Finish	Wires
Pioneer	Eclipse, Impulse	Sauzedde	Own	Sauzedda	Goodrich	Standard Bellanca	Duco	
Pioneer	Eclipse Inerta				Firestone			
	None	Bendix		Bendix	Goodrich	Standard Travel Air	Berryloid	Meewhyte
Consolidated					Goodrich		Duco	
Pioneer	Eclipse, Hand	Hayes			Goodrich	Flightex	Berryloid	
Pioneer and Consolidated	Eclipse, Inerta	Sauzedde		Sauzedde	Goodrich	Flightex	Berryloid	
Pioneer and Consolidated	None	Sauzedde		Sauzedde	Goodrich	Standard Buhl,	Berryloid	
Pioneer	Heywood	Bendix	Cleveland Pneumatic Aerol	Bendix	Goodrich	Glen Martin Special	Sperry Austin	
Pioneer	Eclipse, Hand	Sauzedde		Sauzedde	Goodrich			
Pioneer and Consolidated		Bendix		Bendix	Goodrich	Flightex	Berryloid	
	Eclipse, Hand	Bendix	Aerol	Bendix	Goodyear	Ryan Standard	Ryan Standard	
Pioneer	Eclipse, Hand	Sauzedda		Sauzedde	Goodrich	Flightex	Standard Swallow	
Pioneer	Eclipse	Bendix		Bendix	Goodrich	Flightex	Berryloid	Meewhyte
Consolidated	Eclipse	Bendix		Bendix	Goodrich	Flightex	Berryloid	
Pioneer	Eclipse, Hand	Hayes			Goodyear		Berryloid	
Pioneer		Hayes			Goodrich		Berryloid	
Pioneer	Eclipse, Hend	Hayes			Goodyear			
Pioneer and Consolidated	Eclipse, Inertia, Electric	Bendix		Bendix	Goodrich			
	Eclipse Hand Inerta	Bendix		Bendix	Goodrich to Portland, then Goodyear	Standard Fairchild	Pigmented Dope	
Pioneer	Eclipse, Impulse	Sauzedde		Sauzedda	Goodrich		Duco	
Pioneer					Goodrich	Flightex		
Mostly Pioneer.					Goodrich			
					Goodrich			

Aero Chamber of Commerce Holds Its Annual Meeting

Lester D. Gardner is Elected President and Changes in By-Laws Are Adopted

NEW YORK, N Y —The Aeronautical Chamber of Commerce of America, at its annual meeting, held in this city July 31, elected new officers and a new board of directors, and adopted changes in the By-Laws which will permit the organization to meet the changed conditions and keep pace with the growth of the industry The new officers elected are as follows: President, Lester D Gardner, vice-president (Eastern Division) F B Rentschler, vice-president (North Central Division) Carl B Fritsche vice-president (Great Lakes Division) Col Paul Henderson, vice-president (South Central Division) Walter Beech vice-president (Northwest Division) P G Johnson

The office of vice president of the Southern Division was held open, pending the election of a governor from that district J D Alexander was elected vice-president of the Commercial Airplane Manufacturers' Section, S S Bradley was elected vice president and general manager, Luther K. Bell was elected secretary, and Owen A. Shannon was elected treasurer

The treasurer's report showed receipts about equalling the expenditures and a moderate balance on hand. The general manager's annual progress report showed the increase in the activities which had been made possible by the addition of Jack Harding and Luther K. Bell to the staff of the Chamber. In order to make the organization capable of coping with the great growth in the industry several changes were made in the By-Laws The number of Governors was increased from 15 to 21 so as to make possible a greater regional representation. It was also decided to appoint a larger number of standing committees to deal with the new problems which had arisen. The classes of members were changed so as to be more flexible and allow larger number of people to join the Chamber

Twenty Governors Elected

Of the new Board of 21 Governors 20 were elected as follows: Walter Beech, president, Travel Air Mfg. Co., Wichita, Kans.; S. M. Fairchild, president, Fairchild Aviation Corp., New York, N Y.; C L. Lanrance, president, Wright Aeronautical Corp., Paterson, N J.; F H Russell, vice president, Curtiss Aeroplane and Motor Co., New York, N. Y.; C. J Brucker, president, Advance Aircraft Co., Troy, O., S. S. Bradley, Aeronautical Chamber of Commerce, New York, N. Y., J. D. Alexander, president, Alexander Aircraft Co., Colorado Springs, Colo., E. B. Rentschler, president, Pratt & Whitney Aircraft Co., Hartford, Conn., H F. Pitcairn, president, Pitcairn Aviation, Inc., Philadelphia Pa., L D Gardner, president, Aeronautical Industries, Inc, New York, N. Y.; C. H Colvin, president, Pioneer Instrument Co., New York, N. Y.; Gen. John F. O'Ryan, president, Colonial Air Transport, Inc., and Chairman of Board, American Airports Corp., New York, N Y., J M Russell, president, J M Russell Parachute Co., San Diego Cal.; C T. Ludington president, B B T Corp., Philadelphia, Pa.; Walter Varney, president, Varney Aeroplanes, Inc, San Francisco, Calif.; J. D. Hunsaker, American Telephone & Telegraph Co, New York, N Y.; C B Fritsche, vice president and general manager, Aircraft Development Corp, Detroit, Mich., T. F. Hamilton, president, Hamilton Metalplane Co., Milwaukee. Wis., Col. Paul Henderson, vice president and general manager, National Air Transport, Inc., Chicago, Ill.; and P G Johnson, president, Boeing Airplane Co., Seattle, Wash.

It is the expectation of the new board to invite a representative of aeronautical interests in Los Angeles to fill the vacancy remaining open.

New Plane Tested At Kansas City

KANSAS CITY, KAN. — A plane that has attracted the interest of pilots and business men alike was tested recently on the municipal airport. The plane, a small 560 pound two-place monoplane, powered with a Wright Gale motor, far surpassed expectations of the builders and backers. It was designed and constructed by Dewey Bonbrake, 29-year-old Kansas City pilot, and financed by local business men.

Features of the monoplane, not usually found in small ships, include a baggage compartment, guidable tail skid, split type landing gear and rubber disc shock absorbers The plane is designed primarily for private ownership and is designed to carry a heavier motor if desired. The seats are placed side by side Production is expected to begin soon.

N. A. A. Plans Air Tour

SHREVEPORT, LA. — An All-Louisiana Air Tour is being planned by the Shreveport Chapter of the National Aeronautic Association for the early fall On Aug. 5, this Chapter is sponsoring an air meet to be held on the Shreveport Airport.

Mahoney Opening St. Louis Factory

Total Brougham Production to be 30 Monthly with New Plant

ST LOUIS, MO—Prepared to begin immediate production of planes in the now nearly-completed $100,000 factory at Anglum, St. Louis County, the new Mahoney Ryan Aircraft Corp., capitalized at $1,750 000, plans at first to turn out 10 Ryan Broughams per month. The Mahoney Aircraft Corp of San Diego, Calif., which will continue production will bring the monthly Brougham turn out to 30 or more planes

Directors of the new corporation are P D C Ball, Harry Knight, Harold Bixby, S L. Swarts, John C. Nulson, and B F Mahoney, president of the organization Knight Dysart, and Gamble of St. Louis cared for the underwriting of the stock.

Two largr scale production aircraft factories will be located in St. Louis when the Curtiss-Robertson organization, manufacturing the Robin plane, begins mass production.

On a recent Monday, previous records for Ryan Brougham sales were broken when the San Diego firm received orders and deposits for eight planes. Three of these were for the Guatemalan Government, ordered through M. A. Zmniga, the Central American Mahoney representative three were for the Mutual Aircraft Corp of Los Angeles, one was for the Chinese Government, and one for the Northrop Airplane Co of Minneapolis.

Civil Service to Give Aero Engineer Exams

WASHINGTON, D C—Competitive examination for Associate Aeronautical Engineer and Assistant Aeronautical Engineer has been announced by the United State Civil Service Commission. Applications must be on file with the Commission at Washington not later than September 5 The examination is to fill vacancies in the Bureau of Aeronautics, the Navy Department, Washington, and in the field.

The entrance salaries are $3,200 a year for the associate grade and $2600 a year for the assistant grade. Higher-salaried positions are filled through promotion. The duties are in connection with original research and investigation, or design and construction, in aeronautical engineering

Competitors will not be required to report for examination at any place, but will be rated on their education, training, and experience. Full information may be obtained from the United States Civil Service Commission, Washington, D C. or from the secretary of the United States Civil Service Board of Examiners.

Hesselbach Flies 4 Hours in Glider

Makes Flight at Cape Cod; School Planned to Open There August 15

PROVINCETOWN MASS — Peter Hesselbach a leading German gliding expert of the Darmstadt Germany, engineless flying club, last Sunday made a glider flight of 4 hr. 5 min. from Corn Hill near here in his 300 lb craft, the "Darmstadt." This flight greatly surpassed that of the previous Thursday when Hesselbach flew for 58 min, beating the old American mark established by Orville Wright years ago—a short 9 min 45 sec. glide in a box type craft.

Hesselbach is one of the three German experts who have come to this country, at the invitation of J. C. Penny, Jr., and the American Motorless Flying Club, to introduce the sport to the American public.

The German pilot, launched by the rubberized rope of the ground crew at 9.55 A M, intended to fly through to nightfall for a new world record Gaining altitude he glided and soared back and forth on a one to two-mile course between Corn Hill and the surrounding hills, or out over the white caps of the Bay

Forced Down at Wellfleet

Following a few hours of flight, however, Hesselbach guided the craft on a tour of exploration to discover the nature of other air currents. Suddenly the wind changed and the German was forced down at Wellfleet, five miles from Corn Hill, the wind shift causing loss of altitude.

Hesselbach's altimeter showed he had gained a maximum height of 350 ft in his flight. Wind velocity the German reported to be about 30 m.p.h, at times giving him a speed of 50 m.p.h in his light craft. The distance flown was estimated at 120 m.

The Darmstadt glider is constructed of four ply birchwood and linen, the fuselage and wings being arranged similarly to those of a light powered airplane A simple pedal apparatus actuates the ailerons and a stick controls the rudder. In the takeoff, the rubberized launching rope is released from the craft after the ground crew has drawn it taut and sent the glider into the air.

The world's glider endurance record, established in a craft similar to the Darmstadt, is 14 hr 23 min Furthermore, a continuous flight of 300 mi has been made in Europe with a glider, and an altitude record of 2,715 ft has been made in one of these engineless planes.

Besides the Darmstadt, three other gliders have been brought here by the Germans, one of which will carry a passenger It is planned to start the first American engineless flying school at Corn Hill five miles from here on the bay side of Cape Cod. Capt Paul Roehre, will be in charge of the flights at the school, which it is announced will open about August 15 Roehre and Dr Paul Laubenthal are the other members of the German group The school is being sponsored by J. C Penny, Jr., who is promoting the sport in America, and the American Motorless Aviation Club

Hesselbach's glider, the "Darmstadt," at Cape Cod ready for flight

Capt. Land Named Air Fund Adviser

WASHINGTON, D C — According to a recent announcement by the Navy Deptment, Capt. Emory S Land, assistant chief of the Navy Bureau of Aeronautics, is to act as adviser to the Guggenheim Fund for the Promotion of Aeronautics for a year. Captain Land will begin his work in this capacity on September 1, taking the place of Huteh I. Cone, former naval officer

Captain Land will give his attention primarily to safety devices used in aviation. A graduate of the Naval Academy in 1902, he became Assistant Chief of Aeronautics after the death of Comdr. John Rodgers two years ago.

Designs Rotor Plane Requiring Low Power

WICHITA, KAN—An airplane of unusual design, propelled by rotors and constructed entirely of metal, is to be manufactured at Ponca City, Okla., with the backing of the Ponca City Chamber of Commerce and officials of the Marland Oil Co. It is claimed by the inventor, Dr Edward A Wright, of Wichita, that the plane will require only one-fifth of the power needed to propel the present types and that the plane will right itself automatically if thrown out of balance A 150 h.p. Wright Hispano E-4 engine is to be the power plant.

Wright has left for Ponca City to supervise construction of the first plane. He will be assisted by a corps of practical aeronautical engineers Several months will be required in the building of the Wright Motor It is designed to carry 16 passengers in a cabin located midway between two tapered cantilever wings of 536-ft. spans. The length of the plane will be 80 ft. and it will weigh approximately 8,500 lbs. with pay load, according to its designer Wright claims the machine will fly 2,000 mi. without a stop, carrying only 200 gals of gasoline. Owing to the fact only one-fifth the power will be required to propel it that is needed for the conventional type of plane, a comparatively small amount of fuel is needed its top speed is estimated at 110 m.p.h.

Embry-Riddle Adds 3 New Pilots to Staff

CINCINNATI, OHIO—Three new pilots have been added to the staff of the Embry-Riddle Co at Lunken airport, Cincinnati They are Samuel H. Sharp, Chas H Shield and Thomas J. Hill

With John Paul Riddle, general manager, Stanley C. Huffman, operations officer, Frank Merrill, who recently joined the staff, coming from Texas, Warren R Vine and Charles C Wehrung, this makes a total of eight pilots engaged in flying at the field. The Embry-Riddle company operates the air mail line between Cincinnati, Indianapolis and Chicago, a flying school and does general air transportation work.

Sharp came to the Embry-Riddle company in July from Hadley Field, New York. Shield came to Cincinnati from Louisville, where he had been flying for the Cardinal Fliers Hill had been flying at Huntington, W. Virginia.

Griffin Made Sales Manager

ST LOUIS, MO.—G F Griffin, it has been announced here, has been appointed sales manager of the Curtiss-Robertson Airplane Manufacturing Co of St Louis. For sales purposes the company has divided the country into 25 territories, and William B Robertson, president of the concern, states that already 326 applications for agencies have been received The first stock Robin is being turned out of the plant this week, it is said.

Whirlwind Engines in Use Reported to Total 2,000

Increasing Distribution Necessitates Provision of Adequate Facilities for Servicing

PATERSON, N. J.—Approximately 2,000 Wright Whirlwind engines are now in operation in America, and this number is increasing steadily according to a statement made recently by Guy Vaughan, vice-president and general manager of the Wright Aeronautical Corp of Paterson. About 18 months ago when the greatest part of the production of the Wright company was being absorbed by Government contracts, service work on Wright engines in the field was well taken care of by the organization consisting at that time of Ed Mulligan, Ken Boedecker, Doc Kinkade, and Andy Hufford. These four men together covered the country, taking care of the engines in service, instructing the personnel of Army and Navy air stations in their care and operation, and supervising such overhaul work as was done at the factory.

Within a little more than one year the Service Staff has grown from the group to an organized force of more than 50 men, 16 constantly in the field, and 31 engaged in overhaul work at the factory, as well as an office force for individual orders and correspondence relating to this important phase of the work. The Service Department is under the direction of Kenneth J. Boedecker, as service manager.

In discussing the situation resulting from the increased distribution of Whirlwind engines, Mr. Vaughan said:

"We must provide additional facilities for the adequate servicing of these engines. To accomplish this end a comprehensive survey is being made of the entire country with the view of establishing parts dealers and approved Wright service stations at all of the prominent airplane centers.

To Employ Wright Expert

"Parts Dealers will carry complete stocks of parts and will have in their employ at least one man who has our unqualified recommendation as an expert Wright mechanic. Approved service stations will carry stocks of the most commonly required parts and, like the parts dealer, must employ at least one man who has our recommendation as an expert Wright mechanic. Both classes of representation will have their places of business at or adjacent to flying fields, the parts dealers, of course, being at the larger fields.

"Due to the great number of requests for our franchise, in some cases from 10 to 12 applicants from a single city, we are enabled to exercise the greatest care in making our selections. The granting of a franchise is dependent not only upon the character and responsibility of the applicants but upon their status of independence which enables them to give impartial service to all users of Wright engines.

"The superior type of representation we plan on having is indicated by the standing of the three parts dealers we have already appointed, who are as follows: Pacific Aeromotive Corp, 3417 Angeles Mesa Drive, Los Angeles, Calif; Stout Air Services, Dearborn, Mich., and Air Associates, Inc., Curtiss Field, L. I., N. Y.

10,000 Ft. Delayed Drops Called Safe

DAYTON, O.—Through the use of electrically timed motion pictures, the Army Air Corps Engineers at Wright Field, have found that a man-sized dummy falling from an airplane with a service type parachute strapped to it in conventional manner does not gain any speed after the first 1,500 ft. of unarrested decent.

Drops of up to 3,000 ft. have been made by them before opening the parachute. These drops have all been without any ill effects on the jumper; and it is now indicated by the experiments with dummies that delayed drops of even 10,000 ft. might be made successfully.

It has been suggested that pilots forced to leave their planes in an air battle might drop great distances before opening their chutes in order to foil the attempt of an enemy pilot to follow and fire upon them as they hung in the air.

Efficiency of Szekely Engine Proved in Tests

HOLLAND, MfCH.—A series of service tests of the Szekely SR-3 radial aircooled engine have been conducted recently by the O. Z. Szekely Corp., of Holland, Mich., which is now producing the power plant. The SR-3 engine has a bore of 4 1/8 in. and a stroke of 4 3/5 in. It develops 40 hp. at 1800 r.p.m.

In one of the tests James Williams, president of the Niles Aircraft Corp., Niles, Mich., flew from Niles to Holland and return, a distance of 184 mi. in 1 hr. and 40 min. The engine performed perfectly and Williams was particularly gratified with the smooth running qualities shown.

A previous test conducted by Carl Lutzenberger was a cross country flight from Holland to Erie, a distance of approximately 425 mi. This was made in 4 hr. and 18 min.

Aero Industries Growing Rapidly

Dept. of Commerce Receives 100 Applications Daily for Pilots' Licenses

WASHINGTON, D. C.—The infant aviation industry in America has already developed into a $1,000,000 a year giant and the Department of Commerce is being swamped with applications for pilot's licenses. Based on applications received at the Department, a conservative estimate indicates that at least $100,000,000 is being spent in the manufacture of planes, construction of airports, and transportation of mails and passengers over established routes.

Public interest in aviation has increased so rapidly in the two years since the passage of the Air Commerce Act that facilities of the Department's aeronautics branch have been strained to meet demands. Applications for licenses are pouring in now at the rate of approximately 100 a day. The Department now has 6177 applications pending, while 4292 persons have been authorized to fly in interstate commerce.

Now 1,265 Airports

Building of airports is rapidly becoming a big industry. In the past year an average of 75 airports a month was established. There are now 1265. Air mail routes have grown from 218 mi. ten years ago to 10,816 mi. this month and 4,000 additional miles are expected to be opened this year. Lowering of air mail charges is expected to greatly aid the service.

Established airways for mail and passengers now total 29, with a total of 11,763 mi. and many miles of extensions are planned soon. With the proposed entrance of railroads into air transportation, this service is expected to soon become one of the most important forms of transportation.

There are 130 air manufacturing companies now, compared with only 80 a year ago. There were 1995 planes last year with an aggregate value of $14,504,999, and it is now believed that about 6,000 planes will be turned out this year. Flying schools now number 307, as compared with 161 a year ago.

Pioneer Gets New Contract

NEW YORK, N. Y.—All Challenger airplanes will be equipped with the new small-size air speed indicators built by the Pioneer Instrument Co. as per the terms of a one-year contract recently awarded to that company. The manufacturers of the Challenger, Kreider-Reisner Aircraft Co., Hagerstown, Md., have used Pioneer compasses as standard equipment on all planes built at their factory since they entered the industry.

Monocoupe Sales Record Is Made

Sells 33 of the Velie Powered Monoplanes in 90 Days

LOS ANGELES, CALIF.—Organized in April of this year to handle monocoupes in California, Arizona, New Mexico, Nevada and Utah, the Monoplane Sales Co., Los Angeles, has set up a selling record of more than passing interest. The Monocoupe is manufactured by the Mono Aircraft, Inc., of Moline, Ill.

With no organization other than Mr. James Carpenter, the distributor, and Mr. John Hinchey, General Salesman, this concern has made 33 sales of Monocoupe monoplanes in a period of approximately 90 days from the date of taking the distributorship. A carload of these planes a week is now being distributed in western territory.

Many of the Buyers Amateurs

Many of the buyers of Monocoupes are amateur fliers or business men, and two of the 33 sold thus far are to women. All dealers are giving a special reduced rate on flying lessons to the purchasers of Monocoupe planes, thus making it practical for anyone to buy such a plane, even though he may never have flown previously.

Although the sales made thus far have all been on a cash basis a plan has been worked out whereby it will be possible to buy these planes for $1000 down with a year to pay the balance.

Hundreds of applications have been received for dealerships in Western Territory, but these franchises are being carefully awarded. California dealers being established first, the outer territory being built up to gradually.

In handling sales through the dealers the Monoplane Sales Co. in plans and advertising is cooperating with the Velie organization. Dealers themselves are given considerable freedom in the matter of sales and service methods and storage facilities which may be provided.

Lincoln Company Orders 25

Lincoln Airlines holds the Los Angeles dealer contract and has arranged to take 25 Monocoupe planes as rapidly as they can be delivered from the factory. T. Claude Ryan has taken the San Diego dealership. His first plane has been delivered and he has two a month on order. Sumnitt Aircraft Co., well known operators of San Francisco, have taken the Northern California territory, have bought six planes outright and are arranging to take a carload a week in the future. This company is under the direction of H. M. Holland and Hugh Shippey, former navy men and well-known western fliers. Cardiff and Peacock have purchased six planes and will distribute the Monocoupe in Bakersfield. George A. Carey of National Airlines is the Fresno dealer. William J.

Joins Byrd

Dean C. Smith, veteran mail pilot on the New York-Cleveland route, has joined the Byrd Expedition. Smith will be the fourth pilot on the Antarctic venture.

Angeles and a Mr. Lyons, multi-millionaire, are handling the plane at San Bernardino, operating off the Tri-City Airport. John M. Burnley, of Pomona has bought two and is to handle the Pomona territory. Homer W. Bodum, Long Beach, Calif., Velie and Pierce-Arrow automobile distributor, has purchased one plane and ordered five for distribution in Long Beach.

Air Associates Sets Avian Sales Record

NEW YORK, N. Y.—What is believed to be a record sale is reported by Air Associates Inc., four Avro Avians equipped with Handley-Page slotted wings, being delivered in a space of five days. Purchasers of the planes were Frank Tallman, Garrison Silleck, C. V. Bob all of New York City, and R. C. Love of Pittsburgh. All four intend to use the Avians as private sports planes.

Air Associates has received, in all, six of the Avians from A. V. Roe and Co., Ltd., of Manchester, England. Two will arrive weekly under the contract which will insure 20 of the planes arriving here within 10 weeks.

Adv. Address Corrected

Incorrect addresses have been given twice in the advertisement of Capt. Richard Duncan, author of Air Navigation and Meteorology, which is now running in AVIATION. The correct address is 346 East 51st Street c/o T. Marr, distributor. A review of Captain Duncan's book will be found in this issue under "Reviews."

Form Company to Build Flying Boats

Production Soon to Be Started by New Firm in Hialeah, Fla.

MIAMI, FLA.—In view of the fact that there are very few factories in the country making flying boats, a company has been organized in Miami to manufacture that style of plane. The company is known as the Southern Commercial Aircraft Corp. A factory building, 65 by 300 ft., has been leased in Hialeah, a suburb of Miami, together with 20 acres for hangars and a landing and testing field. Production will begin immediately. The first plane is expected to be turned out in 45 days.

The company later will make land planes, but at first will specialize in the flying boat, which is a three-passenger and pilot cabin biplane, to be called the Southern Sea Hawk.

E. J. Somers, Miami aviator is secretary of the corporation, Walter M. Krouse, manager of the Ritz Hotel, is president, and Merle H. Krouse, his son, an aviator, is vice-president and treasurer. W. J. Snyder of Fort Lauderdale is interested in the corporation. Financing has been completed. Floyd Copeland, formerly designing engineer with the Swallow company, as designer of the boat.

"There are 62 companies in the United States making airplanes and only one of these is making flying boats," Mr. Somers said. "We will manufacture a plane using a Wright-Whirlwind engine. Our plane will be sold for $7,000."

First Milwaukee Show Has Large Attendance

MILWAUKEE, WIS.—Approximately 7,000 persons per day visited the first aircraft show ever held in this city in progress last week at the Milwaukee Auditorium. Large attendance over the entire week gave proof of the public interest in the event.

On display with various types of commercial planes sold in Wisconsin are also two small planes under construction by Milwaukee young men who are members of the Light Plane Club. One monoplane, completed except for connecting controls, was built by Arthur Paukner, the other is the work of Roman Malaszewski.

Other entries include two old Army training planes by Clayton Sager of the Milwaukee Air Transit Co. two light commercial planes of the Travel Air company by the Midwest Air Transport Co., Madison, a Pheasant biplane by Sylvester Wittman of Fond du Lac, Wis., and an American Eagle by the Holerhoff Flying Service, Milwaukee. Accessories are displayed in booths around the arena.

Reviews

The book Department, Aviation, 250 West 57th St, New York City, can supply all books mentioned except government publications N A C A publications may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D C

* * *

Air Navigation and Meteorology is the title of a new treatise on navigation as it pertains to aircraft, which has just been placed on the market It is the work of Capt Richard Duncan, M C, a former flight commander of the Royal Air Force, an instructor in navigation and artillery observation and a licensed pilot.

The book is very complete, although extremely compact. It is of pocket size and contains only 136 pages. The author was enabled to reduce the size by eliminating all theory Yet he has produced a complete and practical work on air pilotage, which will prove of great value to the student as well as the experienced pilot, it is believed. For those desiring to qualify as "Avigators," it should prove a tremendous boon.

The author discusses maps, charts, magnetism, air craft compasses, navigational instruments and variation and deviation in the first few chapters. Chapter seven is devoted to practical navigation In this chapter, the methods of checking and allowing for drift, navigation by dead reckoning, fixing position, the radius of action, cross country flying, and the radio compass are illustrated.

Chapter eight deals with the formation of ice on planes. This is followed by a discussion of the subject of meteorology in which wind, clouds, temperature, storms and storm indications and fog are taken up in turn The book is profusely illustrated with the reproductions of photographs and sketches

In the preface, the author acknowledges his indebtedness to the Pioneer Instrument Co., aircraft instrument manufacturer of Brooklyn, N Y., for the illustrative and descriptive matter on certain navigational instruments. He also credits AVIATION for the chapter deahng with the formation of ice on the wings of planes

Engineering Aerodynamics

Wing sections, wing theory, airplana model tests, parasitic dreg, control surface design, engines and propellers, performance calculation, variation of rate of climb with altitude, aspect ratio and parasite drag, reduction of observed performance to standard conditions, flight testing, range and endurance, special flight problems performance estimation, and seaplane boats are the subjects discussed in this new book on aerodynamics, written by Lieut Walter S. Diehl, (CC) U S N, who is connected with the scientific section of the Navy's Bureau of Aeronautics and is a member of the aerodynamics sub-committee of the N A C A.

"Engineering Aerodynamics" has been written to fill the very definite need which exists for more practical information on aerodynamics for use by aircraft designers and advanced students in aeronautical engineering, according to the author Much of the material presented in this book is entirely original. The author has attempted to include as much new material as possible, and has avoided to this book the repetition of data that is well-known and easily obtainable To provide as much space possible for his discussion of the problems encountered in design, he has omitted the usual description of elementary aerodynamic considerations

Friendship Bought By Air Sportsman

LEROY, N. Y.—Donald Woodward, air sportsman of Leroy who owns a fleet of planes and who is completing a fine private airport here of 143 acres, has purchased the trans-Atlantic Fokker monoplane Friendship in which Wilmer Stulz, Louis Gordon, and Amelia Earhart recently flew from Newfoundland to Wales. Informed that he was the successful bidder for the pontooned plane, Woodward announced he would go to England to ship the craft back to America. Lady Guest, backer of the trans-oceanic flight, made the sale.

N A C A Technical Note No 290 Welding of High Chromium Steels by W B Miller of the Union Carbide and Carbon Research Laboratories, Inc., Long Island City, N Y

Various commercially available, high chromium steels are discussed and their welding properties given. There is a general discussion of the practices for the welding of each of the alloys and suggestions are made for obtaining the best welds Test results of welded specimens are given both before and after annealing The alloys described include rustless iron, stainless steel, and rustless iron with a high nickel content. The tests were made on thin gage materials suitable for aircraft use.

Publications Received

N A C A Technical Memorandum No 376. Designing Seaplane Hulls and Floats by Lieutenant Benoit from "L'Aeronautique", June 1926

N A C A Technical Memorandum No 467. The Diesel as a Vehicle Engine by Kurt Neuman. Translation from Zeitschrift des Vereines deutscher Ingenieure, May 28, 1927.

Technical Memorandum No 469 Choice of Profile for the Wings of an Airplane Part I, by A. Toussaint and E Carafoli Translation from L8 Aeronautique, Dec., 1927.

Technical Memorandum No 469 Choice of Profile for the Wings of an Airplane. Part II. by A. Toussaint and E. Carafoli. Translation from L'Aeronautique, Jan., 1928

N A C A Aircraft Circular 75 Morane-Sulnier 121 Single-Seat Pursuit airplane (French) by J. Serryer. Translation from Les Ailes, Oct. 20, 1927.

Ohio State Aero Group Organized

Manufacturers and Operators Association Formed to Promote Commercial Aviation

CINCINNATI, O—The Commercial Aviation Association of Ohio, Inc., was recently organized at Columbus, state capital, at a meeting of aircraft manufacturers and operators from all parts of the state. A L. Johnson, Dayton was elected temporary president and Judge H T. Williamson, Dayton, temporary secretary.

The purpose of the group is to promote commercial aviation in Ohio and to cooperate with the joint Legislative Committee on Aviation, the Commercial Aviation Committee of the Ohio Chamber of Commerce, and similar organizations, to obtain legislation protecting aircraft manufacturers and operators For this latter purpose the new organization has appointed a legislative committee.

The members, conveyed to Columbus in 20 planes from various parts of the state, were luncheon guests of the Commercial Air Transit Co. and the Columbus Airport Co The next meeting of the association is scheduled to be held at Columbus August 30, at which time permanent officers for the year will be named.

Cincinnati companies and persons interested in aviation who attended the meeting included Watson Airport, the International Aircraft Corp and the Dixie Davis Flying Field, Maj Hugh Watson, Dixie Davis, and C. A Harrison, assistant sales manager of International

Three PN-12 Records Recognized by F. A. I.

WASHINGTON, D C—Three new world records in the C-2 Seaplane class have been recognized by the Federation Aeronautique Internationale, according to announcement made recently by the contest committee of the National Aeronautic Association. All three records were made by Lieuts Zeus Soucek and Lesle Maxson in the Navy flying boat PN-12 powered with two Wright Cyclone engines developing 525 h p at 1900 r p m

The three records were for duration, distance, and speed and were made with a payload of 2200 lbs. and were made at Philadelphia, May 25 and 26. The duration record was 17 hr, 55 min. and 13½ sec., the distance record 1242.7 mi and the speed record 78 193 m p h for 124 mi

N. Y. School Expands Staff

NEW YORK, N Y—The aviation Engineering School has recently added to its staff Lieut. Henry Sperry and Wilbur H Williams. Lieut Sperry has joined the faculty and Williams will have charge of the hangar at Curtiss Field. The school is now located at No 225 West 57th St.

Plan to Expand Rankin Service

System of Flying Instruction to Be Available in All Large Cities

PORTLAND, ORE—Plans for establishment of a branch company to exploit the Rankin system of flying instruction internationally have been announced by J Kegerreis, who has retired from his position of general manager of Rankin Flying Service, Inc, to become president and general manager of the new concern Rankin System, Inc., will be the name of the new company Incorporation articles will be filed within a few days P B Smith and Chase Garfield, members of the present Rankin organization, will be incorporators with Mr Kegerreis Offices will be opened in New York, Chicago, Cleveland, St. Louis and San Francisco

The instruction system was first outlined by J G "Tex" Rankin well-known flier and head of the Rankin company It has been built up during the eight years in which the Rankin School of Flying has been in operation in Portland. The system was first offered for general use under a syndicate plan in May and advertising was started. More than 5000 requests for information regarding it have been received since that time, Mr Kegerreis said Seven flying schools have already signed up for it. Two others have verbally agreed to use it and about 30 more contracts are waiting on completion of the new organization

Schools That Have Signed

Schools which have already signed are the Vancouver, B C, and Seattle branches of the Coast Air Lines, Commercial Air Transport, Everett, Wash., Tacoma Airways, Tacoma, Wash., Grays Harbor Airways, Aberdeen, Wash., Sanders Aeronautical Company, Medford Ore, and Alvene Lichenberger, Pittsburgh, Pa The Boise Flying Service, Boise, Ida. and Mamer Flying Service, Spokane, Wash., are the two that have verbally agreed to use the system

The course covers 14 weeks, including both ground and flying instruction Those, beside Mr Rankin, who contributed to it are Lieutenant B B Smith, chief pilot for Rankin, Edward L Wells, district federal meterologist here; Harry Groat, airplane engine designer and Mr Kegerreis The Rankin School of Flying will be continued as at present. It now claims the largest enrollment in the country, 525 students.

Receives 16 S-H Engines

CARLE PLACE, L. I—Air Transport Equipment, Inc., here recently received a shipment of 16 Siemens Halske five cylinder, air cooled engines rated at 75 hp The power plants were sent from Germany

Red Bird Co. Buys 200 Quick Engines

WICHITA, KAN — Another order for airplane motors involving close to a quarter of a million dollars has just been received by the Quick Air Motors Co. of Wichita. The order was received from the Red Bird Airplane Co, of Oklahoma City, which recently moved its plant from Kern, Kansas, to a new factory site adjacent to an 80-acre landing field at the edge of Oklahoma City. Two hundred Quick static radial engines were ordered. They are converted Le Rhone rotaries made into static radials by patents held by C Eric Quick of Wichita.

Deering Marshall and E. S Keller, Wichita oil operators, head the Red Bird Co, capitalized at $400,000 Production of planes will start as soon as necessary machinery has been installed.

To Have New Steel Tube Source on West Coast

LOS ANGELES, CALIF—The Service Steel Co, of 1435 Franklin St., Detroit, Mich., is opening a warehouse and office at 216 N Almeda St., where a large stock of all popular sizes of steel tubing will be available to aircraft manufacturers in the West

Within a short time the company will be prepared to offer a complete warehouse and mill service on seamless steel tubing in low carbon and all of the popular aircraft grades

Continental to Cincinnati

CINCINNATI, O—Officials of Continental Air Lines, Inc., operating planes on the newly-opened Cleveland Louisville air mail route, announce a change of head quarters of the company from Cleveland to Cincinnati, one of the stops on the line

New 24 Cylinder Engine Develops High Power

INDIANAPOLIS, IND — What is believed to be the largest airplane engine built thus far is the 24-cylinder 1500 hp air-cooled type recently completed by the Allison Engineering Co, of Indianapolis The engine is similar to those used at the Army Air Service experimental station at Wilbur Wright field, Dayton, Ohio and was ordered by the Government to determine if one large engine in a plane is more efficient than three smaller ones for bombing and similar type planes After block tests the engine will be installed in an army bomber plane originally designed for three smaller engines.

The new engine, designed and built entirely in the Allison shops, is known as the Allison X-4520, the figure 4520 representing the cu in piston displacement It is of the perfect X type having 4 rows of six cylinders each, the rows extending on four sides from a central crankshaft The weight is 2 800 lb, or less than two lb per hp The gasoline consumption at high speed is 125 gal. per hour

Carl H. Duede Builds Glider Weighing 60 lb.

STUART, IA—What is believed by its designer to be the lightest glider of its size in the country was built recently by Carl H Duede of Stuart, Ia. This glider has a wing with a span of 24 ft. and chord of 4 ft. 3 in and weighs 60 lb with landing gear and shock absorbers The wing has a large chamber and has 96 sq ft of lifting surface. Stick control is employed in this glider using the warp for lateral stability.

Duede has been identified with aviation for a score of years He began experimenting with engineless planes in 1908, some of his early gliders being pulled by horse and buggy He also experimented with powered planes During the World War he served as a civilian flying instructor and later as an air mail pilot.

Front quarter view of new glider built by Carl H Duede

Improve Fokker Super Universal

Four Planes to Be Used in the Rockies by National Parks Airways

HASBROUCK HEIGHTS, N. J.—Several improvements have been incorporated into the new model Fokker Super Universal Monoplane, manufactured by the Atlantic Aircraft Corp., of Hasbrouck Heights, and deliveries are being made on an order of four of the new model planes for National Parks Airways, Inc., of Salt Lake City, Utah.

Equipped with a Pratt & Whitney "Wasp" engine, the new Fokker Super Universal has a high speed of 140 mi. per hr. and a climb of more than 1,000 ft. per min. with full load. In the new model the engine has been moved forward so that a complete fire wall is now installed between engine and pilot, and all engine accessories have been mounted in front of that wall. Practically all woodwork has been eliminated from the front of the cabin forward. Vision from pilot's cockpit has been improved by slight re-location of the enclosed top and the cockpit has been made slightly wider providing more room for the pilot and his companion.

Upholstered Cross Seats

On the National Parks Airways planes there is a comfortable fully upholstered cross seat for the fifth and sixth passenger at the rear end of the cabin. A spacious baggage compartment is located aft of the cabin instead of a lavatory. Brakes are operated by a ratchet hand-pull similar to the parking brakes on some automobiles and used for the same purpose particularly when starting up the engine from the cockpit. In addition to this familiar operation the brakes are operated independently for taxiing by means of the rudder control itself, without special pedals. The cowling over the nose of the engine is equipped with a rotary shutter operated from the pilot's seat by means of a single rotating shaft and handle so that the cooling of the engine is regulated.

Suitable for Mountain Flying

These planes were chosen by President Alfred Frank of the National Parks Airways and Felix Steinle, general manager, after witnessing the highly satisfactory performance and service given by the first Fokker Super Universal belonging to Mr. and Mrs. A. C. Humphries, Jr., at Denver, Colorado, one mile above sea level. The speed of the new Fokker Super Universal, and control under all conditions, make it especially suitable for airline operation over the mountain states.

National Parks Airways recently received Government air mail contract No. 26 and will operate the line carrying both mail and passengers between Salt Lake City and Great Falls, Montana, a distance of 500 mi. Contract calls for stops at Ogden, Utah, Pocatello, Idaho, Butte and Helena, Montana. To hold this contract a schedule of five hours running time will have to be maintained which should not be difficult with the new Fokker Super Universals.

Dealers of Robin Plane Announced

ST. LOUIS, MO.—The Curtiss-Robertson Co., manufacturers of the Curtiss Robin, has alloted territory to distributors as follows:

State of Missouri to Robertson Aircraft Corp; States of N. and S. Dakota, Minnesota and Western half of Wisconsin to Air Transportation Inc., Minneapolis, Minn.; Eastern half of New York State, including Long Island, to Curtiss Flying Service, New York City, N. Y.; Southern half of California to Henry Sperl Motor Co., Los Angeles, Calif.; Eastern and Northern part of State of Wisconsin and Northern Michigan to Richard Lutz, of Oshkosh, Wis., and the entire export market excepting Cuba, Canada and Mexico to Curtiss Aeroplane Export Co., New York City, N. Y.

C. A. Harrison Joins International Staff

CINCINNATI, O.—C. A. Harrison, formerly a member of the business staff of AVIATION, has joined the International Aircraft Corp. as assistant sales manager. Harrison will be in charge of advertising, publicity, sales correspondence, and contact between the factory sales office and the International distributors.

Mr. Harrison is a graduate of Massachusetts Institute of Technology, Cambridge, Mass., where he studied engineering administration, a course combining the fundamental engineering with business administration and marketing. He also attended Westminster College at his home in Fulton, Mo.

The International Aircraft Corp. is now producing six planes a week at the factory in Cincinnati. Production at present is being concentrated on the F-17 model, which is equipped with any engine from 90 to 220 hp., according to the wishes of the purchaser.

Club to Hold Exhibition

PATERSON, N. J.—An aerial exhibition will be held under the auspices of the Paterson Aero Club from August 6 to 11 at the Grand View amusement park, at which all other air organizations are invited to attend.

Air Investment Company Formed

Directors Are Prominent in Aeronautical Industry, Banking and Transportation

NEW YORK, N. Y.—A new organization to participate in the development of aviation has been formed by a group of business men and is known as the National Aviation Corp. This corporation has been organized in such a way as to offer the investor a means of securing a combination of diversifiestion and experienced management for his funds. Approximately one fourth of the group of organizers are prominently identified with the aeronautical trade, others are associated with the field of general transportation and the bankers and capitalists in the group are interested in the financing of aviation enterprises both in this country and abroad.

It is the purpose of the corporation to place part of its resources at all times in the securities of established companies in the various lines of aviation activities, both manufacturing and transportation. Another portion of the resources will be devoted to the development of such new aviation projects as, in the opinion of the board of directors and the technical staff, merit such assistance.

To Aid Aero Betarprises

New aviation enterprises will inevitably necessitate underwritings and other forms of corporate financing. The company will be prepared to examine and advise on the proper type of capital structure and the distribution of corporate securities to the end that the new enterprises may receive required funds at fair cost. The company also plans to enter into such underwritings as appear to be justified either alone or as a member of syndicates or otherwise. In so doing the company will not merely become a passive investor but will lend the strength of its experience as well as its financial aid in advancing such undertakings.

The general plan of the corporation has been applied in the past to other industries and contributed largely to their expansion. Stock issued to date brings the capitalization to $3,000,000.

Board of Directors

The board of directors, as now constituted includes Howard E. Coffin, Carle C. Conway, J. Cheever Cowdin, Chester W. Cuthell, George W. Davison, Thomas N. Dysart, Sherman M. Fairchild, Paul Henderson, Richard E. Hoyt, Leonard Kennedy, Clement M. Keys, Charles L. Lawrence, E. O. McDonnell, Walter S. Marvin, John J. Mitchell Jr., Grayson M.-P. Murphy, H. E. Talbott Jr., Earle Hay Reynolds, David Sarnoff and James C. Willson. Of these Cuthell, Fairchild, Hoyt, Kennedy, Keys, Murphy and Willson constitute the executive committee.

AIRPORTS AND AIRLINES

Real Estate and Aviation Merged

Company Building Communities Around Its Airport Near New York City

NEW YORK, N. Y.—Three fields are now being operated and two more are being developed by the Suburban Airport Corp. and affiliated companies, whose offices are at 510 Madison Ave. The company plans to establish fields in the rugged country of Northern New Jersey, Southeastern New York, and Connecticut within a radius of 100 mi. of New York and build around the airports communities from which the residents can travel by airplane to the city. Thus the real estate status of these outlying districts will be changed entirely.

The first field operated by this company is located within one-half mi. of the Lackawanna Railroad Station at Lyons, near Bernardsville, N. J. There are 294 acres in the property, 150 of which constitute the airport. The balance is to be sold in lots to create a business and residential community. Student instruction, aerial photography, passenger flying and cross country work is being done now at the field. The Morristown Airport, just off the Morristown-Mendham, N. J. Highway is a tract of 103 acres recently put into operation by the company. A new type of hanger is planned to be erected on this field.

Use Challenger Plane

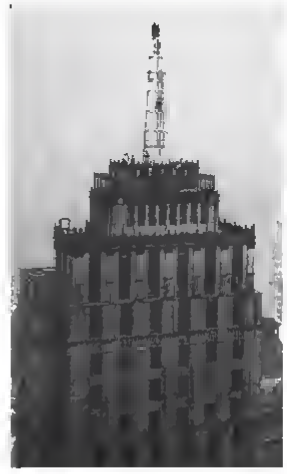
On a high plateau near Darien, Conn., overlooking Long Island Sound, the third field is located and a Challenger biplane is used for student and passenger instruction. This tract is 104 acres in size and 40 acres are used for the field. On the 407 acre tract owned by one of the affiliated real estate companies at Mt. Hope, near Middletown, N. Y. and it is planned in the future to have intermediate fields between this point and Lyons, N. J., bridging a dangerous stretch of flying country.

An 83 acre tract near Summit, N. J., is the fifth field of the company. This is to be the home of the Morris Country Flying Club organized by the company a year ago.

Mail Rate Includes Canada

WASHINGTON, D. C.—Air mail matter posted in the United States and addressed for delivery in Canada, or vice versa, may be sent at the new rate of 5 cents for the first ounce and 10 cents for each additional ounce or fraction.

Chicago's Beacon



Newly dedicated, the Chicago Central Aerial Beacon atop the Roanoke Tower in the Loop district stands at a commanding height 520 ft. above the sidewalks. The light, which was erected and is being maintained by Greenebaum Sons Investment Co., has already been picked up more than 80 mi. from the city.

Peoria, Ill., to Be Stop On Transcontinental

PEORIA, ILL.—Officials of the Royal Airways Co. and the Varney Airport, Peoria, Ill., have completed arrangements whereby Peoria will be linked with leading cities throughout the middle west in extensive passenger service between Chicago, St. Louis and other points. W. J. Cahill, Minneapolis, treasurer of the Royal Airways; E. R. Fitzgerald, Chicago vice-president, and A. W. Beaurline, Davenport, Iowa, a director; Alex Varney, owner of the Peoria Airport, and John Shoshe, president of the Blue Motor Coach Line attended the conference which will result in a bus line and aviation service tie up.

A tri-engined plane on the trans-continental route between St. Louis and Chicago will make intermediary stops at Peoria and Springfield and development of the Peoria Airport will be planned to meet requirements of this new service.

Lincoln Acquires Site for Airport

Bond Issue of $100,000 Voted for Development of 160 Acre Tract

LINCOLN, NEB.—The Lincoln City Council has now bought a 160-acre tract of land northwest of the city as a site for the municipal airport, for which a $100,000 bond issue was voted on April 10.

The land is four and one-half miles from the post office on the S. Y. A. Highway. Definite announcement that the transcontinental airmail line will include Lincoln caused the Council to hasten its action in selection of an airport site.

The selection of the site was made after an inspection by Frank E. Caldwell, superintendent of the Boeing Air Transport, Inc., of all the tracts that have been under consideration.

Because the land is so level there is a possibility that runways will not be necessary, Mayor Verne Hedge said. Should the soil not be solid enough it is likely under runways will be built.

Work of equipping the airport and preparing it for use will begin as soon as the transfer to the city is complete. The land is under cultivation, approximately 40 acres being in corn and the remainder wheat, which has been harvested.

Fields Inspected for N. Y.-Montreal Route

ALBANY, N. Y.—State Senator J. Griswold Webb, chairman of the Joint Legislative Committee on Aviation has recently completed an inspection of the landing fields for the New York-Montreal air mail service. These inspections show everything will be in readiness to start the service September 1.

In the opening schedule a plane will leave New York at 9 a. m. and stop at Poughkeepsie, Albany, and Burlington, Vt., arriving in Montreal at 1 p. m. A return trip will be made by a plane leaving Montreal at 4 p. m. on the same afternoon. This plane will make the same stops made by the north-bound plane and is scheduled to arrive in New York at 8 p. m.

Making Flights Over N. Y.

NEW YORK, N. Y.—Daily sightseeing flights over New York City are now offered by the Martin Travel Bureau, 18 W. 34th Street, using two Ireland Whirlwind powered metal flying boats. Passengers are taken aboard at 125th Street and the Hudson.

Newark Airport Soon to be Ready

Formal Dedication Planned on Completion of First Unit Next Month

NEWARK, N. J.—Formal dedication of the Newark Municipal Airport, the first unit of which is rapidly nearing completion, will take place some time in September. More then a million dollars has been spent by the city in developing and equipping the first unit of this field which promises to be one of the principal air mail and passenger termini for Greater New York and the Metropolitan section of Northern New Jersey.

Air mail lines between New York and Atlanta, Chicago, Boston, Montreal and Buffalo will have their New York terminal at the Newark airport as son as it is ready for use. Capital Airways will land and take on Washington passengers here and other companes are planning regular service between Newark and Detroit, Pittsburg, Miami and Los Angeles. With the completion of the Newark airport, National Air Transport, which carries the mail between New York and Chicago, proposes inauguration of passenger service on this route, and Pitcairn Aviation, Inc., which flies the mail planes between New York and Atlanta, is also planning to establish regular passenger service.

Levine to Build Factory

Charles A. Levine has announced that he will locate an airplane factory at the Newark field. The New Jersey National Guard has leased a part of the field for its air unit, and commercial companes have leased hangard and office space for service stations, photographic and taxi work, sales offices, sightseeing planes and student training.

The construction of the airport was ordered by Mayor Thomas L. Raymond less than a year ago. This first unit covers about 150 acres. A second unit, to be ready for use next spring, will add another 150 acres to the field, which is planned ultimately to include 500 acres devoted to landing fields, hangars, waiting rooms and commercial aeronautical establishments.

The Newark airport adjoins the municipal docks at Port Newark, on the shore of Newark Bay, between Newark and Elizabethport. With the completion of state highways under construction the airport property will have an extensive frontage of the principal automobile highway between Camden and Jersey City, and will be but twenty minutes from lower Manhattan.

Licensed by the Department of Commerce, the Newark airport will be governed by the rules and regulations of the government, and all pilots, mechanics and others using the field will be required to hold government licenses. Strict local regulations will be enforced against low flying and stunting.

The site of the Newark airport was formerly salt marsh and has been filled and drained. The runway, which is 800 ft. wide and nearly a mile in length, is being sodded, and a takeoff strip 200 ft. wide and 1,000 ft. long is being built of cinders and concrete to eliminate dust at the takeoff. The municipal hangar, approaching completion, is 120x120 ft., and built of brick and steel, the foundation set on piling. A two-story brick air mail postoffice building is also being erected by the city, with facilities for handling 20,000 lbs. of mail daily.

City to Fill in Site

In announcing plans for the second unit of the airport, Mayor Raymond explained that the city would dredge a second ship channel at Port Newark and use the material dredged to fill in the new airport site. Studies of weather reports covering a period of five years, made before the location of the Newark airport was begun, showed an average of only two days a year in which there was sufficient fog to make flying conditions unsafe.

Plans for the lighting of the big airport, now being worked out, are elaborate. Boundaries of the field will be distinctly marked, all buildings and obstructions will be marked with red lights, and the entire field will be brightly illuminated by floodlights.

Airport Committee For Alexandria, Minn.

ALEXANDRIA, MINN.—Since the Presidential Express began making regular stops here the interest in aviation has been intensified. This has resulted in the appointment by the Chamber of Commerce of an airport committee with Dr. B. W. Brokaw as chairman and the other members being H. B. Robards, Casper Reuter, C. O. Franzen and R. L. Swore. The Kiwanis Club has also appointed a committee, Dr. Brokaw being in charge and is assisted by Edgar Haugen, H. S. Campbell, P. R. Johnson, O. L. Hall, A. W. Peterson, Dr. P. E. Kierland, C. B. Lund and H. B. Robards.

Hall at Fisk Park Airport

SPRINGFIELD, MASS.—Lieut. Elzor Hall, who operated the Springfield Ground School here last winter and who this spring opened a repair depot at Westfield Airport, has moved to the Fisk Park Airport in this city. His activities there will include management of ground and flying schools designed to give advanced work in both divisions.

Wisconsin City Buys Site

WATERTOWN, WIS.—Seventy acres have been purchased south of the city for a landing field for the local airport which was approved last week by the city council. Work to put the field in shape will begin shortly.

Six Air Corps Bases To Get Radio Beacons

WASHINGTON, D. C.—Radio beacon stations are to be established at six Army Air Corps fields within the next few months, according to an announcement by F. Trubee Davison, Assistant Secretary of War for Air. At present Panama and Hawaii are the only bases at which the Army Air Corps maintains radio beacons.

The six fields at which the flight guiding apparatus will be installed are Bolling Field, Washington, D. C.; Mitchell Field, L. I., Kelly Field, San Antonio, Tex.; Wright Field, Dayton, O., and the stations at Sao Francisco, Calif.; and Uniontown, Pa.

The radio beacon sends three parallel signal waves in the desired direction of flight. The middle wave letter is "T," the right wave "N," and the left wave "A." As long as the pilot hears the letter "T" he is on the correct path, but should he swerve from his course to the right or left, he is apprised of the fact by hearing the letter "N" or the letter "A," respectively. The radio beacon signals may be thrown in any direction and can be broadcast in lengths varying from less then 100 mi. to nearly 2,000 mi.

Nevin Air Lines Now Operating New Field

NEW YORK, N. Y.—The Nevin Bus Lines, operators of five long distance and several local bus lines in New York, Philadelphia and Pittsburgh, is planning to extend activities into the field of airline operation. In order to gain experience for this a field has been established at Kingston, N. J., where a short stop is made in the New York-Philadelphia bus line. Passengers who desire to complete their trip by airplane in either direction from this point can now make the transfer.

The new company, which is known as Nevin Air Lines, has procured the agency in that territory for American Eagle planes and is operating three of these on their 350 acre field at Kingston. Three runways have been already constructed and contracts for aerial photography, cross country flights and other work are now being taken. It is planned to incorporate for $200,000 next spring and to operate large cabin planes between several cities in the East.

Air Service to Saratoga

NEW YORK, N. Y.—An air route between Roosevelt Field, L. I., and Saratoga, N. Y., will be opened on or shortly after August 1, and will continue throughout the month, according to an announcement made by Paul Lannin, owner of Roosevelt Field. Four airplanes, two Travel Air biplanes and two Stearman biplanes, each carrying two passengers, will be used in the service.

The planes will leave Roosevelt Field at noon each day arriving in Saratoga in time for the first race.

New Southern Calif. Airport Dedicated

LOS ANGELES, CALIF.—Rogers Airport at Pomona, was opened recently with elaborate ceremonies. The new field is completely equipped with every airport convenience, including night lights, is 3000 ft. long and 800 ft. wide, and is rated as one of the best flying fields in Southern California. It is located near the government air-mail beacon, directly on the mail route east out of Los Angeles, and is open at all times to all licensed pilots and certified planes.

Speakers at the dedication exercises included J. M. Paige, secretary of the Pomona Chamber of Commerce, who acted as chairman; Dr. T. C. Young, of Glendale; Lieut. Chandler, March Field; Wallace Beery, screen actor; Ruth Elder, Atlantic girl-flyer; Lieut. G. O. Noville, of Commander Byrd's crew; Cliff Henderson, Gen. Mgr. of the California Air Race Association; Lieut. Jack Fry, Pres. of the Aero Corp. of Calif.; and a number of other prominent men.

The grounds were officially christened "Rogers Airport" in memory of Cal Rogers, first transcontinental flyer, who landed at the present site in 1911. Rogers was killed at Long Beach, Calif., shortly following the completion of his transcontinental flight, when a sea gull flew into the propeller of his machine, shattering it and pluning the plane to the ground.

Work Progressing on Atlanta Air Mail Lines

ATLANTA, GA.—Announcements regarding completion and initiation of service on three air mail lines radiating from Atlanta were made last week by Department of Commerce representatives.

Lighting of the Atlanta-New Orleans route between Atlanta and Selma, Ala., has been begun under the supervision of F. J. Jennings and Carl Schanche, of the Department of Commerce. The Muhleman Kaylioe Co. of Richmond, Va., has the contract.

Alvin W. Smith, of the department of commerce announced that a survey of the Atlanta-Chicago air mail line would be started within about a month, according to plans of the department. Mr. Smith also announced that the Atlanta Miami line survey for lighting between Atlanta and Jacksonville, Fla., has been completed.

Pitcairn Aviation, Inc., contractors on the Atlanta-Miami line plan to begin operating the line as soon as the lighting is completed which is expected to be on or before January 1 1929.

Circus at Buttonwoods, R. I.

BUTTONWOODS, R. I.—The Texas Oil Co. sponsored an Air Circus recently held at the Buttonwoods, Rhode Island, airport. Passenger flights and daily exhibition flights brought hundreds of visitors to the field. Besides the Texaco planes, many free-lance fliers entered.

Municipal Airport Leased by Boston

BOSTON, MASS.—Success has finally crowned the efforts here to bring about cooperation in the improving of the Boston Airport and its establishment as the Boston municipal field. With the Governor, Mayor, Boston Chamber of Commerce, and Boston Municipal Air Board in agreement, the Boston Airport is being leased to the city, under authority of the legislature, for 20 yr. at $1 a year for the first 10 yrs. and a rental for the second 10 yrs. to be determined later.

Cincinnati Surveyed For Aerological Base

CINCINNATI, O.—W. R. Gregg, head of the aerological department of the U. S. Weather Bureau, and Thomas H. Washington, have been making a survey in Cincinnati of the needs of that city for an aerological station to provide weather forecasts for aviators.

They conferred with W. C. Devereaux, meteorologist at Cincinnati, Chamber of Commerce officials, and local airport attaches, with a view to linking commercial aviation and the weather report service. The survey in Cincinnati is a result of requests sent to Washington by airport officials, asking that a station be established. Such service would mean erection of an 'upper air' observation station, probably at one of the flying fields.

The service is deemed necessary because of the airmail route now being operated by the Embry-Riddle Co., local concessionaries, and the night service soon to be started by the Continental Air Lines, operating out of Watson Airport. Establishment of an observatory would mean prompt weather reports for pilots on these lines, as well as all other aviators in the district.

Lincoln, Neb., Bus Co. To Start Air Service

LINCOLN, NEB.—Interstate Transit Lines, which operates motor coaches between Omaha, Fremont, Lincoln, Norfolk, Kansas City and Sioux City, is to inaugurate an interstate air service in connection with its bus lines. T. J. Manning of Omaha, will have charge of the air division. Myron Larkin, pilot since 1919 will be the chief pilot. R. J. Walsh is president of the company.

Manning announced that they would have an air school for student pilots, sight-seeing and charter trips and air photo service as well as a regular air route, on scheduled time, between Omaha and other points.

Three Ryan Brougham planes have been purchased at an expense of nearly $50,000.

New Lancaster Field Dedicated

Ralph Haynes Wins Meet Honors as Pennsylvania Airport Opens

LANCASTER, PA.—Pennsylvania's newest flying field—the Lancaster Airport—was dedicated late in July with elaborate ceremonies and an air meet in which nearly 40 planes and more than 100 pilots, mechanics and aero company officials participated. The airport, situated along the Manheim Pike, scarcely more than a mile from the center of Lancaster's business district was lined with well over 10,000 spectators. Among the airmen and officials were men from six states—Pennsylvania, New York, Delaware, New Jersey, Maryland, and Virginia.

It remained for Ralph Haynes of Elmira, N. Y., to take the majority of the flying honors. Piloting a Waco 10 (OX-5) he won first place in four of the five events staged on the first day. Joseph P. Jones, manager of field operations for the Lancaster Airways Inc., took part in all of the events, taking second prize in the 25 mi. race for planes equipped with OX-5s, second prize in the balloon strafing contest, and several special mentions.

Wins with Travel Air

Piloting a three-place, OX-5 Travel Air, Val Miner, also of Elmira, won the 25 mi. OX-5 race. He had four competitors. Haynes took the dead stick landing contest, with Gardner Nagle, of Pottstown, Pa., winning second prize, and Jesse P. Jones, third. Haynes also won first prize in the stunt contest. Howard Rittenhouse, of Pottstown thrilled the crowds with his parachute jumps.

The meet was sponsored by joint committees from the Lancaster Chamber of Commerce and the American Business Club. On the Chamber of Commerce committee were A. C. Darmstaetter chairman, C. Allen DePugh, A. B. Dodge, Carl Dreppard, Frank B. Hall, Louis Hartman, S. S. Suter, J. Hale Steinman, A. D. Howrey, J. A. Lucky, J. A. Maxwell, William S. Rank, William Shand and W. B. Morey. Representing the American Business Club were Louis Hartman, chairman, Edward Weaver, Clair McCullough, Bagby Pollard, Charles Addams, Robert Rohrer, H. K. Spahr and Dr. R. W. Klemmer.

Fair Haven Field Opened

FAIR HAVEN, N. Y.—Army pilots from Mitchell Field, L. I. took part on July 21 in the dedication reremonies which marked the opening of the new airport here. The site is located near the State Park, 16 mi. from Oswego, 40 mi. from Syracuse and 60 mi. from Rochester. The airport has two 100 ft. runaways, one 2000 ft. in length and the other 2500 ft. in length.

MANUFACTURERS' SPECIFICATIONS ON ENGINES AVAILABLE FOR COMMERCIAL USE AS COMPILED BY AVIATION

THE TABLE BELOW IS BELIEVED TO BE ACCURATE BUT *AVIATION* DOES NOT ASSUME RESPONSIBILITY FOR THE FIGURES GIVEN

This table will appear monthly and corrections and suggestions are invited

Manufacturer or Agency	Engine	Cooling System	Cylinder Arrangement	No. of Cylinders	No. of Cycles	Propeller Drive	Rated Hp. and R.P.M. at Sea Level	Maximum Hp. and R.P.M. at Sea Level
Aeromarine Engine Co.	Comet	A	Rad.	7	4	D	[illegible]	[illegible]
Allison Engineering Co.	V1410	A	1V-45°	12	4	D	[illegible]	[illegible]
Allison Engineering Co.	VG1400	A	1V-45°	12	4	D	[illegible]	[illegible]
Allison Engineering Co.	V1650	W	1V-45°	12	4	D	[illegible]	[illegible]
Brownback Motor Laboratories, Inc.	Anzani 3-35	A	Rad.	3	4	D	35-1700	40-1900
Brownback Motor Laboratories, Inc.	Anzani 6-60	A	Rad.	6	4	D	60-1550	[illegible]
Brownback Motor Laboratories, Inc.	Anzani 10-120	A	Rad.	10	4	D	120-1800	[illegible]
Curtiss Aeroplane & Motor Co.	OX-5	W	V-90°	8	4	D	[illegible]	[illegible]
Curtiss Aeroplane & Motor Co.	OXX6	W	V-90°	8	4	D	[illegible]	[illegible]
Curtiss Aeroplane & Motor Co.	C-6A	W	L	6	4	D	[illegible]	[illegible]
Curtiss Aeroplane & Motor Co.	D12	W	V-60°	12	4	D	[illegible]	[illegible]
Curtiss Aeroplane & Motor Co.	Conqueror V 1570	W	V-60°	12	4	D	[illegible]	[illegible]
Curtiss Aeroplane & Motor Co.	Conqueror GV-1570	W	V-60°	12	4	G	[illegible]	[illegible]
Dayton Airplane Engine Co.	Bear	A	L	4	4	D	[illegible]	[illegible]
Fairchild Caminez Eng. Corp.	Caminez 447-C	A	Rad.	4	4	D	[illegible]	[illegible]
Hallet Mfg. Co.	H-526	A	Rad.	[illegible]	4	D	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Further columns: Weight Dry Without Hub or Starter; Weight Per Rated Hp.; Bore and Stroke (in.); Compression Ratio; B.M.E.P.; Displacement (Cu. In.); Frontal Area (Sq. Ft.); Diameter of Mounting Ring or Distance Between Centers (in.); Overall Diameter (in.); Height (in.); Length (in.); Guaranteed Fuel Consumption at Rated Hp. Lb./Hp./Hr.; Oil Consumption Lb./Hp./Hr.; Valve Mechanism; Cylinder Construction (See Key); No. Intake Valves Per Cylinder; No. Exhaust Valves Per Cylinder; Make Spark Plugs Supplied With Engine; Type of Ignition; Make Ignition; No. Carburetors; Make Carburetors; Make Starter; Are Exhaust Manifolds Provided; Shipping Weight Crated; Dept. of Commerce License; Cost at Factory — [illegible]

Key: N—No; O—Own; ohc—Overhead cam; prr—Push rods and rocker arms; Rad—Radial; RB—Robert Bosch; S—Scintilla; Sc—Scintilla; St—Stromberg; Sn—Stromberg NA-U5 duplex; Sg—Stromberg NA-R6E; Su—Sum; Sp—Splitdorf; S—Steel; U—U.S.L. Electric; V—Vee; W—Water cooled; Wh—Whirlwind; Y—Yes; Z—Zenith; [illegible]

FOREIGN ACTIVITIES

Prague Company Tests New Engine

Now producing seven cylinder air cooled radial type developing 240 h.p.

PRAGUE, CZECHOSLOVAKIA—J. Walter & Co., manufacturer of aviation and automobile power plants, has recently added a new aircraft engine to its line. The Walter Castor engine is a seven cylinder air cooled static radial type developing 240 hp at 1750 r p m. It was recently tested under the supervision of a committee of the Ministry of Public Works, having passed successfully the tests according to the international rules of the C I N A. The engine has a bore of 5¼ in and a stroke of 6⅝ in. It has a compression ratio of 6-1 which permits of a substantial increase over normal output under full throttle on the ground. The weight of the power plant complete including propeller hub is 545 lb

Poldi Steel Used

All special steels used in the construction of the Walter Castor engine are made by the well known Poldi Steel Foundries. Cylinders are built of single blocks of hammered steel machined to form the cooling ribs and mounting flanges. The heat treated aluminum cylinder heads are bolted to the cylinders and secured with a special locking device making the heads interchangeable. Bronze valve seats are pressed in the cylinder heads and rolled. Supports for the rocker arms are screwed into the cylinder heads and rolled. Supports for the rocker arms are screwed into the cylinder head reenforcements. Valves are made of special wolfram steel and each has three spiral springs. Each cylinder has one inlet and one exhaust valve. The pistons are constructed of a special alloy of aluminum reenforced by ribs at the top. Each piston has two compression rings and one oil scraper ring.

Special Master Rod

The master connecting rod is of the big end type of chrome nickel steel and I section. Two specially designed roller bearings are fitted in the big end and bear on the crank pin assuring the longevity of the engine. Link rods of cylindrical section are pinned to the big end of the master rod and are counterbalanced assuring an even running engine. The two piece counterbalanced crankshaft is supported on two roller bearings and the thrust is taken up by an axial bearing in the front cover of the crankcase.

The crankcase is composed of two parts and has two covers. The castings are held together with bolts which are also used in mounting the engine. Two rows of cams are placed on the cam disc which is in the front portion of the crankcase. There are two rows of cams on the disc. Exhaust valves are actuated by the front row and intake valves by the rear row.

The specifications as furnished by the manufacturers are as follows.

No. of Cylinders	7
Bore	5.26 in.
Stroke	6.62 in.
Compression ratio	6-1
Normal output	240 hp at 1750 r p m
Maximum output	260 hp at 1850 r p m
Fuel consumption	.48-.50 lb per hp. hr.
Oil consumption	.035-.044 lb per hp hr
Weight	545 lb

Jap Company Now Takes Passengers

TOKIO, JAPAN.—A regular passenger air service has been established between Sakai and Oita, Japan. Three times a week the Nippon Air Transport Laboratory has been flying mail over this route, and now the organization has undertaken a daily passenger service using seven seaplanes. But one passenger can be carried besides the pilot and mechanic in these planes.

The distance between the cities is about 252 mi., while the schedule flying time is 3 hr. 10 min., with stops at Takamatsu and Imabaru. The fare one way is $18 including allowance for baggage.

Caproni Building 60 Planes Yearly

Developing 12 Engine Craft of 6,000 Hp. and 3 1-2 Tons Useful Load

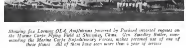
MILAN, ITALY—The Caproni Company of Milan, which is the manufacturing establishment making the largest airplanes in Italy, is working on a production scale at present of about 60 large planes a year. It is reported that the company's potential capacity is several times larger, for at the end of the World War the company was producing planes at a rate of about 60 a month.

Technically, the most important recent development in the Caproni Company's operations is its standardization on all-steel production. After extensive tests, the firm's engineers have adopted thin-section steel of high tensile strength, made in Italy, such use being based largely on experience in dirigible construction. The wings and fuselage, however, are still covered with fabric or wood, only the interior construction being of steel.

The company now makes two principal types of airplanes, one with two engines of 500 hp and one with four engines of 500 hp each. It is now developing a 12 engine plane, it is reported, with a total of 6,000 hp and useful load of 3½ tons.

Caproni planes are characterized by their low center of gravity, the lowest point of the fuselage having a clearance of about three feet above the ground. The mounting of the engines in all the multi-power plant planes is in tandem. The principal types of engines used are Isotta-Fraschini (water cooled) and Jupiter (air cooled), the Italian manufacturing license for which is held by the Alfa Romeo Co.

Marine Corps Amphibians in China



Showing five Loening OL-6 Amphibians powered by Packard inverted engines on the Marine Corps Flying Field at Shanghai, China. Gen. Smedley Butler, commanding the Marine Corps Expeditionary Forces, makes personal use of one of these planes. All of them have seen more than a year of service.

Germany First In Air Mileage

Also Leads in Passengers and Freight Through France Keeps Mail Record

BERLIN, GERMANY—German air ways placed first in European air mileage for 1927 with a total of 5,921,593 mi., according to statistics recently made public France, with 3,755,369 mi was second, while Great Britain's airways stood third with 873 000 mi. The German passenger total was 102 681—more than all the other lines combined, the grand total being 199,369

Following Britain in mileage was Italy, fourth with 824,474, and the Netherlands, fifth with 813,510. Second place in passengers carried went to England, whose total was 20,344, while Sweden was third with 14,069 passengers.

Germany also led in the third department—that of carrying freight. Her total poundage was 3,225,595 lbs France, whose 1927 figures were not available, was named second on the strength of her 1926 record of 2,354,269 lbs., while Britain was third with 1,456 000 lbs. Incidentally, the Netherlands developed greatly in freight carrying during 1927 with a 886,114 lbs total

Germany in 1927, however, was unable to break the record for air mail poundage established by France in 1926. The French mark was 1,311,567 lbs, while Germany was short of this figure with 1 057,812 lbs British air mail statistics were not available, while other European countries had negligible poundage in comparison with Germany and France

Australian Company Completes 4th Year

MELBOURNE, AUSTRALIA—Australian Aerial Services, Ltd., with headquarters at the Melbourne Aerodrome has completed its fourth year of air mail and passenger operation Inaugurated in June, 1924, the service was increased in July 1925, by two feeder lines, one from Melbourne to Hay and the other from Broken Hill to Mildura both schedules timed to meet the through planes from Adelaide to Coolamundra

The company's fleet, comprising single engined planes of post-war design, has now flown 600 692 mi. with 9,287 passengers without a single fatality. This mutual mileage without fatality is a record in Empire air services The distance flown is equal to 24 flights around the world at the Equator or nearly three times the distance to the Moon.

New Airport at Toronto

TORONTO, CAN—A new fully equipped airport has been opened for traffic here by the Canadian Air Express, Ltd

Traffic Record Set At Le Bourget Field

PARIS, FRANCE.—Passenger and freight traffic at the Le Bourget Airport reached a new record mark on a recent Saturday, when 22 commercial planes left the field with 112 passengers and six tons of merchandise aboard. With 20 planes arriving with 170 passengers and five tons of freight, the total traffic was 43 planes, 282 passengers, and 11 tons of freight.

The former record day was Sept. 23, 1927, when 37 planes arrived and left with 288 passengers and 10 tons of freight

Company Formed to Build Planes in Sweden

STOCKHOLM, SWEDEN.—According to a statement issued by Assistant Trade Commissioner Basil D. Dahl, a new airplane manufacturing company has just been organized there The company will be known as the Aeroindustry Stratus and will manufacture airplanes of the two-passenger sport type equipped with engines ranging in power from 80 hp to 450 hp. They anticipate selling these planes for about $2,415 A factory has been purchased at Kungsor near Eskilstuna

The company has appealed to the National Government for aid in this venture A request for a loan of $42,950 without interest has been made In the event that the loan is not granted the company has requested that the Department of Aeronautics of the National Government be authorized to place an order for $26 840 warth of airplanes of various sizes, payment for these planes to be made in advance

It is expected that this new company will be able to furnish airplane engines to the Royal Swedish Army and Navy at about 80% to 85% of the prices now being paid for imported engines of similar size

East Indian Company Will Open Two Lines

BATAVIA, JAVA—A recently signed contract between the Netherland East Indian Government and the Netherlands Indian Air Service Co enables the latter concern to organize and exploit air lines in this country, according to Donald Renshaw, trade commissioner at Singapore

The air company is granted the right to carry out all operations in connection with air traffic such as pleasure, tourist and propaganda flights, air photography and air surveys, etc., while it agrees to maintain the following regular lines: (a) a daily service between Batavia and Bandoeng and vice-versa and between Batavia-Samarang and Sourabaya and vice-versa, maintained by land planes, to commence on Sept 3, 1928, (b) a weekly service between Batavia-Singapore-Belawan and vice versa, connecting in the latter place with the mail boats, to be maintained by seaplanes and to be opened in the first week of 1929

All machines must be fitted with radio telegraph and radiotelephone receiving and sending sets and carry operators capable of operating them The Government will grant a subsidy of approximately $120 600 for the year 1928 and approximately $402,000 for 1929 and each following year until the end of the agreement. The head office of the company will be situated at Batavia, and it is expected that the center point of the air lines will be Bandoeng

British Mail Service Wide

LONDON, ENG.—British senders of mail or parcels are offered air service to foreign countries all over the world by the British Government, according to announcements here. Instructions for the acceptance of letters, post cards, printed and commercial papers, samples, and parcels throughout Great Britain for domestic and foreign air mail have been issued by British postal authorities.

European Airway Traffic for 1927

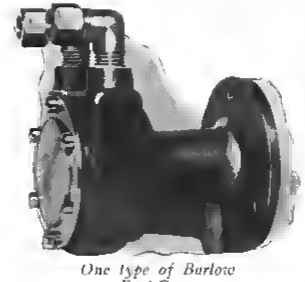
	Miles flown	Passengers carried	Baggage and goods carried (lbs)	Mail carried (lbs)	Average daily mileage (2)
Austria	245,043	4,274	134,117	3,745	1,220
Denmark	116,798	1,630	84,143	13,581	580
France	3 755 369	7,799(1)	2,354,269(1)	1,311 567(1)	22,500
Germany	5 921 593	102 681	3,225 595	1,057,812(3)	33 000
Great Britain	873,000	20 344	1 456,000(3)		4,200
Italy	824 474	12,517	308 247	14 771	2 863
Netherlands	813 510	12,816	886,114	77 597	4.000
Poland	654.873	8,160	599,210	29.063	3,270
Sweden	206 766	14 069	167 893	15 428	1 300
Switzerland	459 720	10 823	235 828	103,588	2 300
Czechoslovakia	257,888	4,233	82 964	1,795	1 298
	14 096 034	199,369	9,599 340	2 628,547	76,531

(1) 1926 *later figures not available* (2) *Estimated* (3) *Includes excess baggage and mails This table is subject to correction*

THE BUYER'S LOG BOOK

Barlow Fuel Pumps

A NEW type of liquid fuel pump, revolutionary in design but proven in exacting tests, has been developed by Lester P Barlow, research engineer of the McCord Radiator & Mfg Co., Detroit Mich. While the new pump has been built to meet the demands of aeronautic service it is equally adaptable to automotive and marine installation



One type of Barlow Fuel Pump

The Barlow fuel pump is compact in size and simple in operation No valves or springs are used in its construction and there are only five moving parts. A convenient mounting base is incorporated in the casting and a large cover plate is provided for inspection or disassembling

The pump has been tested under the various conditions of aeronautic service and is endorsed by leading aeronautical engineers. Tests over hundreds of hours show a negligible amount of wear and it is estimated that the device has a life many times greater than any internal combustion engine

Summerill Tubing

SPECIAL ATTENTION is given to the manufacture and preparation for shipment of seamless steel tubing for the aircraft industry by the Summerill Tubing Co, of Bridgeport, Pa An aircraft inspection department is maintained especially for this class of material and their aircraft tubing does not at any time come in contact with the commercial grades of steel

The steel used is specially selected open hearth or electric furnace made to the analyses required by Government specifications After being rolled into billets and before piercing, it is carefully chipped to remove surface defects. This is necessary to produce a surface free from imperfections When the billets have been properly prepared they are pierced and hot rolled with the most modern equipment This produces a hot rolled seamless tube of unusual uniformity. These operations are carried out at the source of supply.

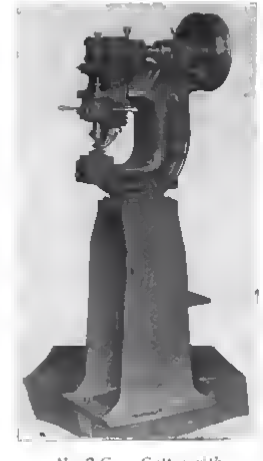
From the hot working mills the steel is shipped in carload lots to warehouses where it is classified and checked for analysis by Government inspectors and reinspected by a force of trained men employed by the company After going through the processes of cold drawing, annealing, pickling and straightening, the tubing is given the final heat treatment which is necessary to meet the Government specifications The No 1025 is given a special heat treatment while the chrome molybdenum is normalized This work is done in a gas fired furnace automatically controlled

After the material has been finished and inspected the chrome molybdenum tubing is Rockwelled for hardness. These tubes are numbered consecutively, a record being made of each reading The required number of tensile, crush and other tests necessary to meet the specifications are also performed and the material is then passed or rejected This procedure is followed in shipments to customers or with material that is prepared for warehouse stocks

Material for shipment is measured and packed in wooden cases with packing slip in each case showing amount of material, size, grademn order number, etc. There is no charge for boxing Certified test reports are furnished with each shipment

Gray Cutter

THE NEW model Gray cutter, manufactured by the W J Savage Co, Inc., of Knoxville, Tenn., is a double purpose machine for shearing or nibbling metal stock It is a valuable addition to the equipment of any shop where shapes are cut for jigs templates and aeroplane fittings Seven different models are made and material up to one inch in thickness can be cut accurately without fracture



No 2 Gray Cutter with 12 in Throat

The machine consists of a steel throat mounted on a high base brining the cutter within easy reach of the operator The cutting mechanism is a reciprocating cutter in the upper jaw of the throat acting in conjunction with a die in the lower jaw. Two bearings on the top of the throat carry the drive shaft which is driven by an electric motor attached to the back of the base. The machine is manufactured with throats of different sizes from eight to 36 in

The cutter is of the best quality high speed steel and is held rigidly in the tool holder which is arranged so that the tool can be set down to the proper length after grinding permitting use of the tool until worn out There is no possibility of side movement or side shifting of stock during operation

The National Air Tour

(Continued from page 407)

parture of the aerial cavalcade They came by auto, horse, train and airplane, some of the planes coming down from Canada. It was said that six or seven of the farmers in the vicinity of Froid, own their own planes and use them to oversee the needs of their huge acreage, doing in an hour what had required a day by automobile and several days by horse Including the Tour planes approximately 35 planes were on the Froid field

Many of the spectators in Froid were Indians—old chiefs, young braves, maidens, and squaws—who came in from surrounding reservations to inspect closely the world's latest and fastest means of transportation.

Senator J. W. Schnitzler, the man responsible for the Froid stop, presided at a luncheon tendered the Tour personnel at the Froid Hotel The smoothness with which the entire program was carried out and the way the comparatively enormous crowd was handled was remarkable considering the size of the town Froid, the smallest stop on the tour route, need bow to none other in that respect.

Cleveland Has Engine Trouble

In the early afternoon the Tour resumed flight, going to Minot, N Dak, 146 mi distant, where the planes landed on the municipal airport Only one of 24 entries failed to make Minot on scheduled time. E W Cleveland, pilot of Ryan number nine, had trouble with his wheel brake just prior to his scheduled take off and flew into Minot a few minutes later.

The next jump of the tour, from Minot to Fargo was made the following day. All of the entrants flew the 228 mi between those cities on scheduled time, except two Dan Robertson was forced down at Sutton, N. D. with engine trouble and George Haldeman was compelled to change propellers after having damaged his in striking a mudhole while taking off the Minot field.

Heavy rains visiting the eastern portion of the northwest just prior to the tour's arrival placed the North Dakota fields in rather poor condition, and causing some speculation as to whether the planes could land on the Fargo airport. The heavier planes in the entourage, especially the tri-motored Ford and the tri-motored Fokker, found both North Dakota fields a tight squeeze

The tour landed in Fargo on the opening day of the North Dakota State Fair Sir George Hubert Wilkins, noted Austraban explorer, and Lieut. Carl Ben Eielson, who recently flew Captain Wilkins over the Polar regions in a Lockheed monoplane, were on the field to greet the fliers The Lockheed monoplane, used by Wilkins and Eielson, was among the visiting planes on the airport Eielson had just concluded a visit to Hatton, his home town, and he and Sir George were in Fargo to make an appearance at the State Fair.

With computation of scores in Fargo there was no change in the standing of pilots. The ten leaders who were "in the money" in their order of standing were as follows: John P. Wood, Frank M. Hawks, Randolph G. Page, Charles W. Meyers, Eddie Stinson, Bruce Braun, Al Henley, Billy Brock, Vance Breese and Louis G Meister.

After an overnight stop in Fargo 23 of the contesting planes again took to the air, crossing the Red River into Minnesota and resuming a southeast course across that lake-strewn state to St Paul. The Curtiss-Robin, piloted by Robertson, still was in Sutton when the Tour planes landed at the day's destination Parts were shipped him for his engine Tail winds that helped the planes on the jump between Minot and Fargo again were beneficial during the 218 mi hop between Fargo and St Paul, all of the pilots being credited with perfect scores for the leg, except Robertson, and Gould Beard, pilot of Waco, number 28, who was delayed in Fargo with a broken rocker arm stud Beard brought his plane to the St Paul airport later in the afternoon.

Bruce Braun, pilot of Stinson entry, number 22, returned to the Fargo field shortly after his take off with a blown spark plug. Braun replaced the plug and again started for St. Paul, succeeding in arriving there within his allotted time. At this point in the Tour Braun, who had scored 25 perfect legs out of 27 flown, was leading Al Henley, pilot of Ryan number 10, for sixth place by a slight margin. An imperfect leg score might have placed Henley ahead of him. Henley, who had considerable engine trouble, had, at that time, flown 22 of the 27 legs on perfect schedule.

The standing of the first 15 planes at St Paul was as follows

Position	Plane No	Make	Pilot	Score
1	18	Waco	J. P. Wood	22,761.4
2	2	Ford 3-Motor	Frank Hawks	20,399.3
3	21	Stinson Jr	R. Page	19,122.5
4	19	Waco	C. Meyers	18,536.1
5	20	Stinson	E. A. Stinson	17,377.5
6	22	Stinson	B. Braun	16,719.8
7	10	Ryan	Al Henley	16,494.9
8	1	Bellanca	W. S. Brock	16,338.3
9	16	Ryan	Vance Breese	15,427.3
10	8	Buhl Airsedan	L. Meister	14,985.1
11	23	Lockheed	L. Schoenhair	14,317.3
12	24	Fairchild	R. W. Pears	13,411.5
13	3	Travel Air	J. N. Kelly	13,170.2
14	25	Bellanca	Geo. Haldeman	12,589.4
15	17	Swallow	V. Aavang	11,462.8

Although, in St Paul, five legs of the tour route remained to be covered, Johnnie Wood was virtually certain to win over all contestants. Wood's lead over Frank Hawks, second man, was such that Hawks could not have bested him had he flown the five remaining legs perfectly against but two perfect legs and no points at all on the remaining three, by Wood By the same token Wood could have flown but one perfect leg, with no points for the remaining four, and beaten Randy Page, third high man, even if Page had flown all five legs on schedule

Positions Not Settled

Other positions in the prize money standing, were, however, by no means as settled. Charlie Meyers, 486.4 points behind Page, and with nearly the same figure of merit for perfect legs, was crowding Page for third place. As stated, Henley, with a slightly larger figure of merit than Braun, was crowding Braun for sixth place, while Brock, with a figure of merit slightly less than that of Henley, was little more than 100 points behind the latter Vance Breese was nicely established in ninth place, a position he held since the start Louis Meister and Lee Schoenhair, just 825.3 points apart, were vieing strongly for tenth position Meister, the holder of that place in St. Paul, had a figure of merit of 592.4, while Schoenhair had one of 575.2

In St. Paul, the last two-day stop of the tour, reception arrangements were made by Col. L. H. Britten, general manager of Northwest Airways, Inc., and the St. Paul Association. Mrs. Omlie, whom St. Paul remembered as a high school student little more than eight years ago, and who had not yet failed to make page one in all of the cities thus far visited, was probably the most acclaimed of all the contesting pilots

The next two succeeding legs were flown on July 26, the first being a 169 mi hop from St. Paul to Wausau, Wis., home of John Paul Wood. Twenty-four competing planes made the flight, Robertson having repaired the engine of his Curtiss Robin, and caught up with the fliers at St Paul the preceding day. The first plane to take the air at St Paul took off on scheduled time, immediately following a light shower, the first rain of any kind the Tour had encountered since the day of its arrival in San Antonio With the shower was a brisk breeze,—a tail-wind over the course to be flown. All of the pilots made perfect scores on the flight into Wausau, despite the fact that one of them, Kelly, landed near Stanley, Wis., to replace two fouled plugs

In order to give Johnnie Wood leader of the Tour an opportunity to dash over the line on his home field ahead of his fellow fliers, the pilots voted to allow him to start first Johnnie got there first

It was Wood Day in Wausau, although Wausau's reception for the entire Tour personnel was as enthusiastic and as well carried carried out as any city the Tour had thus far visited Those on the Tour were given a luncheon served in the Alexander airport hangar, and after a three-hour stopover, took off at 2 p m on the twenty-ninth leg of the route.

Ten Percent Extra Allowance

The afternoon leg, between Wausau and Milwaukee, was officially listed as 145 mi, but when it was discovered that the Milwaukee County airport was situated 15 miles south of that city a 10 percent extra allowance was granted the competing pilots. Favorable winds again speeded the planes on their way southeast and all of the airmen made their destination with plenty of time to spare One contestant, Jack Atkinson, did not arrive in Milwaukee on scheduled time. Atkinson's engine dropped a valve and he landed for repairs near a small town between Wausau and the day's destination. The pilot wired that he expected to complete repairs and reoin the tour before they left Chicago

In Milwaukee the planes landed on the old Hamilton airport, now known as the Milwaukee County Airport The pilots and passengers were tendered a banquet in the evening at the Plankinton hotel. The following morning, July 27, they flew 80 mi to the Cicero Airport at Chicago

Considerable fog hovering along the lake shore and over the Cicero field, threatened for a time to cause the take off from Milwaukee to be delayed, but after C. G. Andrus, of the United States Weather Bureau, traveling on the tour through the courtesy of that governmental department, advised tour officials that an 1,800 ft. ceiling existed in Chicago, it was decided to take off on schedule

A 30 mile tail wind boosted the planes along, and all of them made splendid time in getting over the short route Louis G Meister, pilot of the Buhl sesquplane was credited with the best time, having flown the distance in approximately 35 min

Two pilots, Richard W. Pears, of Fairchild, number 24, and Merlin V. Aavang, of Swallow, number 17, both of whom claim Chicago as their home town, raced for the honor of being first into their home port Pears took off first Aavang was preceded by several of the slower competing craft Pears beat Aavang into the Cicero airport by a slight margin Aavang had the faster of the two planes

With the exception of Atkinson, who was forced down the preceding day, every one of the contestants registered perfect scores The standing in Chicago was unchanged

Reid, Murdoch and Company, wholesale grocers, whose plane, Buhl, number 7, piloted by Alger Graham, competed in the tour, were hosts to the tour personnel in Chicago A luncheon, accompanied by vaudeville entertainment, was tendered the fliers in the company's plant, shortly after their arrival from Milwaukee At the beginning of the long tour Reid, Murdoch and Company

presented every one going on the trip with two quart thermos bottles in a leather case, and at every stopover the 6,300 mi. route, had members of their organization fill the bottles with the company's Monarch coffee, or whatever the owner might REASONABLY desire. "Bob" Nesbitt, sales promotion manager, represented the company on the tour, travelling in the Ryan brougham flown by "Pop" Cleveland.

Atkinson, equipped with a new engine, the third new engine to be placed in Tour entrants, landed on the Chicago municipal airport late Friday afternoon, and took off as the first of the competing planes the following morning. But two legs, a 150-mi. hop to Battle Creek, and a 100 mi. flight from Battle Creek to Detroit, remained to be flown.

Two planes were slightly late arriving in Battle Creek, although it was not the fault of the planes. Lee Schoenhair, pilot of the Lockheed, and Alger Graham, pilot of the Buhl Airster, for some reason or other, failed to arrive at the Chicago field in time to take off at their scheduled time. Some of the planes had difficulty locating the Battle Creek airport. After a luncheon served on the Battle Creek field, the 24 planes took in the order of their score standing, every one of them negotiating the final 100 mi. of the Tour with perfect scores.

Among those present at the trophy dinner at the Statler, besides the Tour pilots, their mechanics and passengers, were Brig. Gen. James E. Fechet, chief of the Army Air Corps., Carl E. Schory, secretary of the National Aeronautical Association, Ward Van Orman, balloonist, Eddie Rickenbacker, World War ace, Maj. Thomas G. Lanphier, and many other prominent figures in the aeronautical, business and political worlds. Rickenbacker was toastmaster, and Senator Arthur H. Vandenberg of Michigan, delivered the principal address.

The National Air Races

(*Continued from page* 401)

Besides the exhibits and the races, a number of conventions will be held during the days of the air meet. These include the national convention of the N. A. A. Five hundred delegates of this association are expected to attend. Other meetings and conventions include the National Association of Air Mail Pilots assembly, the annual meeting of the Professional Pilots Assn. and the convention of the Society of Automotive Engineers. There will also be gatherings by a number of the largest aviation clubs and the sales organizations of many manufacturers. An attempt to organize the airport managers throughout the country will also be made.

Those in charge of the meet and the exposition are Dudley M. Steele, who is in charge of the aviation department of the Richfield Oil Co.; Theodore T. Hull, president of the American Aircraft Corp.; D. E. McDaneld, president of the Los Angeles Chapter of the National Aeronautic Association; Dr. T. C. Young; Harry Wetzel, V. P., Douglas Co., John Bowers, president of the Western College of Aeronautics, and Robert J. Pritchard, editor of "Western Flying."

The following in the summary of events:

Opening Date, Saturday, Sept. 8, 2 P. M. International Aeronautical Exposition of all types of Airplanes and Accessories, 2 P. M. to 10 P. M.

SUNDAY, Sept. 9—International Aeronautical Exposition. 10 A. M. to 10 P. M.

MONDAY, Sept. 10—International Aeronautical Exposition. 10 A. M. to 10 P. M. Finish of New York to Los Angeles Transcontinental Air Race.

TUESDAY, Sept. 11—International Aeronautical Exposition. 10 A. M. to 10 P. M. Finish of Pan-American Air Race, Mexico City to Los Angeles, also finish Class "A" California Air Race, San Francisco to Los Angeles.

WEDNESDAY, Sept. 12—International Aeronautical Exposition. 10 A. M. to 10 P. M. Finish of International Air Race, Windsor, Canada to Los Angeles, also Class "B" California Air Race, Oakland to Los Angeles.

THURSDAY, Sept. 13—FAMOUS FLYERS DAY. International Aeronautical Exposition. 10 A. M. to 10 P. M. Finish—Transcontinental Non-Stop Air Race New York to Los Angeles.
California Model Aircraft Exhibition.
Airplane Flying Model Exhibition.
U. S. Army Fighting Airplanes Stunting.
U. S. Navy Airplanes in Battle formation flying.

FRIDAY, Sept. 14—International Aeronautical Exposition. 10 A. M. to 10 P. M.
Closed Course Races for Commercial planes.
Closed Course Races for U. S. Army planes.
Parachute Jumping.
Stunts and formation flying.

SATURDAY, Sept. 15—International Aeronautical Exposition. 10 A. M. to 10 P. M.
Closed Course Races for Commercial planes.
Closed Course Races for U. S. Navy planes.
Parachute Jumping.
Stunts and Formation flying.

SUNDAY, Sept. 16—International Aeronautical Exposition. 10 A. M. to 10 P. M.
Closed Course Races for Commercial planes.
Finals in Army and Navy Pursuit plane races.
Finals in Parachute Jumping contest.
Spectacular destruction of Village by Army and Navy Bombing planes.
Stunts by World Famous pilots of the U. S. Army and Navy.

Summary of trans-continental and closed course air races and field events is as follows:

TRANSCONTINENTAL AIR RACE
NEW YORK TO LOS ANGELES
(Civilians Only)

Total Cash Prizes—$40,000.00 and Valuable Trophies.
Sweepstakes Prize—$5,000.
$4,000.00 to be awarded to the two ships making the shortest elapsed time regardless of cubic inch displacement of engine, or type of plane.
$1,000.00 to first multi-engined plane to finish.

Class "A"—$10,000—open to all type ships powered with engines of 510 cu. in. displacement or less.

Winner	$5,000	Fourth	$700
Second	2,500	Fifth	500
Third	1,000	Sixth	300

Class "B"—$15,000—open to all type planes powered with engines of more than 510 but not to exceed 800 cu. in. displacement.

Winner	$7,000	Fourth	$1,000
Second	3,500	Fifth	700
Third	2,500	Sixth	300

Class "C"—$10,000—open to all type planes powered with motors of more than 800 cu. in. displacement, either single, bi, or tri, engined planes.

New York State's Greatest AIR-MEET and EXPOSITION

October 3, 4, 5 and 6, 1928

To Be Held at the Dedication and Opening of the

Albany Municipal Airport

ANNOUNCEMENT

EXHIBIT SPACE FREE

to Manufacturers, Dealers and Distributors

—of—

PLANES, MOTORS, PARTS and ACCESSORIES

THIS will be the most pretentious undertaking ever put forth in the State of New York to bring together the greatest aggregation of well known pilots, commercial and government planes, prominent aviation officials and prospective purchasers of airplanes, motors, parts and accessories This Air-Meet will excel in number of airplanes participating any previous meet ever undertaken in this part of the country.

The Aircraft Department will be educational in character, and it is planned to show goods manufactured by the Aircraft Industry to be used as an advertising medium to secure agencies and orders in New York and Eastern States and to acquaint the public with the different lines of aircraft manufactured

$2,000 IN CASH PRIZES IS TO BE AWARDED TO PILOTS PARTICIPATING IN AIR-MEET EVENTS

EXHIBIT SPACE FREE

Address communications for exhibit space to

Albany Air-Meet and Exposition

SUITE 52

86 STATE ST., ALBANY, N. Y.

Entry blanks will be forwarded to all licensed pilots

Winner ..... $5,000 Third $1,500
Second ..... 2,500 Fourth 700
Fifth $300

TRANSCONTINENTAL NON-STOP AIR RACE
NEW YORK TO LOS ANGELES

Prizes—$22,500 and valuable trophies
Open to all type planes powered with any type engines. Cubic inch displacement unlimited.

Winner .....$12,500 Third $3,000
Second ..... 6,000 Fourth 1,000

INTERNATIONAL AIR RACE
WINDSOR, CANADA TO LOS ANGELES

Prizes—$10,000 and valuable trophies
Open to all type planes powered with engines of 800 cu in displacement or less, piloted by citizens of Canada only.

Winner ..... $5,000 Fourth $700
Second ..... 2,500 Fifth 500
Third ..... 1,000 Sixth 300

PAN AMERICAN AIR RACE
MEXICO CITY TO LOS ANGELES

Prizes—$10,000 and valuable trophies
Open to any type plane, using any type engine All planes to be piloted by citizens of Latin American countries only.

Winner ..... $5,000 Fourth $700
Second ..... 2,500 Fifth 500
Third ..... 1,000 Sixth 300

CALIFORNIA AIR RACE

Class "A"—San Francisco to Los Angeles
Prizes—$2,000 and valuable trophies.
Open to all type planes powered with motors of 510 cu. in. displacement or less

Winner ..... $1,000 Third ..... $ 250
Second ..... 500 Fourth 150
Fifth $100

Class "B"—Oakland to Los Angeles
Prizes—$3,000 and valuable trophies
Open to all type planes powered with engines of greater than 510 cu. in but not exceed 800 cu in. displacement

Winner ..... $1,250 Fourth $500
Second ..... 800 Fifth 150

NATIONAL AIR RACES
CLOSED COURSE RACES and EVENTS

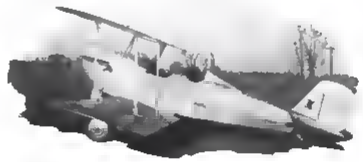
In addition to the cash prize named, there are valuable trophies in each event

SPECIAL EVENT No. 1
Breaking World's Airline Distance Record
Prize—$5,000 in cash Valuable trophy.

SPECIAL EVENT No. 2
Breaking World's Endurance Record
Prize—$5,000 in cash Valuable trophy.

SPECIAL EVENT No. 3
Airplane Model Building Contest
Prizes—$750 00 and Valuable Trophies
Open to any boy or girl of 18 years or under who is a resident of the State of California

SPECIAL EVENT No. 4
Airplane Model Flying Contest
Prizes—$750 00 and Valuable Trophies.
Open to any boy or girl of 18 years or under



HASKELITE - equipped plane built by the American Eagle Aircraft Corp., Kansas City Mo

Maintained quality safeguards lives

COMMERCIAL builders, although not bound by rigid specifications applying on government craft, must safeguard the public by adhering closely to the best standards of quality set in the industry.

HASKELITE is used almost exclusively by builders who accept this responsibility.

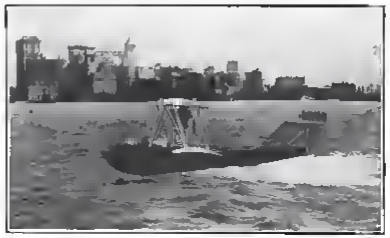
PLYWOOD HASKELITE PLYMETL

HASKELITE MANUFACTURING CORPORATION
120 S. LaSalle Street, Chicago, Illinois

CALIFORNIA PANEL & VENEER COMPANY
955 S. Alameda Street, Los Angeles, California

RAILWAY AND POWER ENGINEERING CORP., Ltd
Toronto Montreal Winnipeg New Glasgow

All-6 Gray



Ireland Flying Boats

The demand for flying boats for use by commuting sportsmen and sightseeing operators has caused us to devote our entire production facilities during this summer to aircraft of this type

Practically the same ship as the successful Ireland Amphibian but with certain improvements which puts the Ireland Flying Boat in a class all by itself Of course powered with the dependable Wright Whirlwind. Seats five

Write for complete details

IRELAND AIRCRAFT, Inc.
Curtiss Field, Garden City, N. Y.

TRUSCON AIRPLANE HANGARS

Built for one use—and therefore better for that purpose than any other type of construction which might merely be "adapted" to air plane housing Truscon Hangars are all steel, therefore fire safe, permanent and without excess weight to raise cost Construction is from standard steel sections so that additions can be taken care of, or hangar expediently dismantled for re erection elsewhere Unobstructed floor space permits easy handling of ships Special doors open full width of hangars. Steel windows for daylighting An unusually attractive price advantage

Data on request

TRUSCON STEEL COMPANY
Established 1902
YOUNGSTOWN, OHIO
Warehouses and Offices in All Principal Cities

EVENT No. 1
RELAY RACE
(Civilians Only)

Four teams—five ships to each team—OX-5 original type engines only.

PRIZES—$1,500 and Valuable Trophies

Winner ... Third ...
Second ... Fourth ...
$150 to each pilot on the winning team
$75 to each pilot on the second team
$50 to each pilot on the third team
$25 to each pilot on the fourth team

EVENT No. 2
FREE FOR ALL
(Civilians Only)

Open to all type planes powered with engines of 510 cu in displacement or less.

PRIZES—$2,500 and Valuable Trophies

Winner	$1,200	Third	$4 00
Second	600	Fourth	200
Fifth	$100		

EVENT No. 3
FREE FOR ALL
(Civilians Only)

Open to all type planes powered with engines of 720 cu in displacement or less

PRIZES—$1,500 and Valuable Trophies

Winner	$700	Third	$250
Second	400	Fourth	150

EVENT No. 4
FREE FOR ALL
(Civilians Only)

Open to all types of open cockpit planes powered with engines of 800 cu in displacement or less All ships to carry total of 340 lbs which includes the weight of the pilot

PRIZES—$3,500 and Valuable Trophies

Winner	$1,500	Fourth	$350
Second	800	Fifth	250
Third	500	Sixth	100

EVENT No. 5
FREE FOR ALL SPEED AND EFFICIENCY CONTEST FOR THE AVIATION TOWN AND COUNTRY CLUB OF DETROIT TROPHY.
(Civilians Only)

Open to all type cabin planes powered with engines of 800 cu in displacement or less

PRIZES—$4,000 and Valuable Trophies

Speed		Efficiency	
First	$750	First	$1,200
Second	450	Second	700
Third	200	Third	400
Fourth	100	Fourth	200

EVENT No. 6
FREE FOR ALL FOR THE DETROIT NEWS AIR TRANSPORT TROPHY
(Civilians Only)

Open to all type cabin planes, either single, bi, or tri, engined ships All planes to carry a minimum contest load of 1000 lbs at a minimum speed of 80 m p h

PRIZES—$3,000 and Valuable Trophies

Speed		Efficiency	
First	$800	First	$800
Second	500	Second	500
Third	200	Third	200

EVENT No. 7
PARACHUTE JUMPING CONTEST

Open only to members of the United States Army, Navy or Marine Service.

PRIZES—$1,000 and Valuable Trophies.

Winner	$350	Third	$100
Second	200	Fourth	50

Special Prize daily of $100 for the Jumper coming closest to the mark on each of the three days of the meet.

EVENT No. 8
(Military Only)

Open only to observation two place type airplanes. Individual trophy awards to first four place winners.

EVENT No. 9
NAVY PURSUIT PLANES RACE
(Military Only)

Open to all Navy Pursuit planes of any type and horsepower.

Individual trophy awards to first four place winners.

EVENT No. 10
ARMY PURSUIT PLANES RACES
(Military Only)

Open to any type of Army Pursuit plane and of any horsepower.

Individual trophy awards to first four place winners.

EVENT No. 12
FREE FOR ALL MILITARY PURSUIT RACE
(Military Only)

Open to any type plane powered with any engine, in the Army or Navy of the United States or any foreign country.

Individual trophy awards to first four place winners.

EVENT No. 14

Special Event open to National Guard, Army and Navy Reserve pilots flying PT training type two place airplanes powered only with 180 hp Hispano-Suiza engines.

PRIZES—$500 and Valuable Trophies

Winner	$250	Third	$75
Second	125	Fourth	50

EVENT No. 15
LIGHT AIRPLANE
SPEED AND EFFICIENCY CONTEST
(Civilians Only)

Open to all type planes powered with engines of 300 cu. in. displacement or less.

PRIZES—$3,000 and Valuable Trophies.

Speed		Efficiency	
Winner	$750	Winner	$750
Second	375	Second	375
Third	250	Third	250
Fourth	125	Fourth	125

The Repair of Damaged Fuselage Members

(*Continued from page* 403)

the stub ends of the removed member (Fig. 3). In either case, the joints should be made as near the ends of the damaged tube as possible in order not to decrease the column strength due to welding.

In making joints, the fish mouth type should be used

when possible. The slope of the joint should make an angle of 30 deg. or less with the axis of the tubes.

Paint, rust, dirt and grease should be removed from the parts to be welded with sand paper, or with a wire brush.

When replacing a tube, care should be taken to see that the structure is aligned properly and held in that position

FIG 3

during the welding operation. Reference to dimensional drawings of the structure involved, or by measurement of parts not affected will give the necessary information.

Performance Calculation and Slipstream Effect

(*Continued from page 405*)

(4) B $P_{sv} = P_t + P_p + P_r$

It is apparent from (4) that, if P_1 plus P_g is plotted without slipstream correction and P_{sv} as calculated from

Propeller characterics and engine power curves is reduced by B and plotted, the power useful for climb will be the difference between the two curves

Derivation of Formula

Let T = propeller thrust in #

A = propeller disc area in □'

V = velocity of flight in mi/hr

V_s = velocity of slipstream in mi/hr

P = mass density of air in $\frac{\#\ sec^2}{ft^4}$

M = mass of air passing thru propellor disc per second

1.4667 = ratio of velocity in feet/sec to velocity in mi/hr

$2.151 = 1.4667^2$

The commonly accepted propeller theory is that, of the increase in velocity of the slipstream, half is added before passing the propeller disc and half after passing it, i.e.

velocity thru prop disc $= \frac{V_s + V}{2}$

Therefore

$$M = 1.4667\ A\rho\ \frac{V_s + V}{2}$$

$$T = 1.4667M\ (V_s - V) = 2.151\ A\rho\ \frac{V_s + V}{2}$$

$$(V_s - V) = \frac{2.151}{2}\ A\rho\ (V_s^2 - V^2)$$

$$V_s^2$$

$$(1)\ V_s^2 = \frac{2T}{2.151 A\rho} + V^2$$

Let D_i = induced drag of airplane in pounds

(4) may be written, for monoplanes

$$B\,P_{av} = \frac{W^2}{3S^2V} + \frac{K\,V^2}{375} + \frac{C\,W}{33000}$$

Solving for C

$$C = (BP_{av} - \frac{W^2}{3S^2V} - \frac{K\,V^2}{375}) \frac{33000}{W}$$

For average biplanes the term $\frac{W^2}{3S^2V}$ becomes $\frac{W^2}{381S^2V}$

If cruising performance is desired the power required at a given speed is divided by B to obtain the actual power to be delivered by the propeller.

The New "Corsair"

(*Continued from page* 404)

surface is hinged to the bottom of the desk and when closed provides a dust proof cover. The seat in the rear cockpit is an armchair, affording a maximum of comfort on long cross country flights. Dual rudder pedals, a detachable stick and a throttle control make it possible to fly the plane from the rear cockpit. The rudder pedals are directly under the desk and the throttle control is on the left side of the cockpit. An altimeter is mounted on a small panel at the left of the desk and an air speed indicator is similarly mounted at the right. Brief cases and other small articles may be stowed in compartments at the side of the cockpit and four suitcases may be placed in a large baggage compartment in the fuselage behind the cockpit. A large sliding windshield when closed covers the entire cockpit making it windproof.

Assistant Secretary Warner has already put his plane into use by flying to Montreal, Can., to attend the Summer session of the Society of Automotive Engineers. On its initial trip the plane was flown to Ottawa, Canada and to Detroit, where Assistant Secretary Warner viewed the start of the Gordon Bennett Balloon Race and of the National Air Tour.

In design the plane is identical to the standard two place Navy observation fighter type and is capable of a high speed of more than 160 m.p.h. and a cruising speed of 135 m.p.h. It is a single bay type with N struts and a split axle landing gear. The plane has been shown to possess remarkable flying characteristics. The first Corsair to come off the production line was delivered to the Naval Air Station at Rockaway, N. Y. late in 1927 and easily surpassed all of the requirements of the Navy test. The stock models have on several occasions shown superior performance to the early experimental planes. The four world records established by a Corsair were formerly held by France and Italy. These countries used specially prepared planes to establish the records.

The Vought Corporation is one of the oldest and largest manufacturers of aircraft in the country. The first Vought product, the V E 7 training plane, produced in 1918, had such remarkable construction characteristics that many of them are still in service.

Modern Management and the Industry

(*Continued from page* 402)

numerous and varied, but they fall naturally into three groups representing the three main divisions of the business, namely: The productive operations, the marketing

of the product, and the financing and control Under these heads they are as follows

Production

- Provision of plant and equipment
- Engineering, experiment, and design
- Purchasing of materials, supplies, and special services
- Stores and warehousing
- Labor, supervision, and welfare
- Methods and standards
- Maintenance
- General management of production

Marketing

- Publicity, advertising
- Selling
- Prices, discounts, allowances
- Shipping and distribution
- General management of marketing

Advertising

- Costs, billing, and accounting
- Credits and collections
- Financing and control

It is through its effects on these various elements that the specialized knowledge of What, How, When, and By Whom has influenced industry. Through it, notable advances have been made in every field, but the greatest achievements have been in that of Production. These have been accomplished not only through the great improvement of methods and equipment, but through the accumulation of knowledge as to the productive capacity of machines, and the development of systems for planning and controlling production Twenty-five years ago, in production, such knowledge was mainly exercised by the individual workman, but just as no railroad could run successfully if train movements were determined by the individual train-crews, so production could not advance nor costs come down until production-management in all its phases came under central control. Not only has the exercise of this knowledge been centralized in production-planning departments, but the methods of finding the facts which constitute it have, through time-study and research, been reduced almost to an exact science

Must Adopt Methods

These methods of production control, with the parallel developments in stores control, overhead control, predetermined costs, and organization, are the methods which the airplane or engine builder must adopt if he is to stay in the race. In applying these methods we must realize that the end lies, not in the costs and records, but in the control of production and expense, and this control must be exercised before and during the controlled operation—not after. The thing desired is not so much a cost system for recording in minute detail what *has been* spent in the various operations, the requirement is for exact, advance knowledge and planning of what *should be* spent, coupled with provision of the means necessary to carry out these plans In place of post-mortem cost-figuring, modern management substitutes advance production-planning, and says: "Carry out your operations as directed and your costs will be as planned You need no other cost-system." Should these ideas seem radical, let us again be reminded that the object of doing business is not to keep records but to make profits. Could we, in some way, be assured of the profits, minus the bother of records, we should certainly choose that way, and this, in effect, is what modern management claims to do

In comparison with most lines of manufacturing, the airplane industry is unusually well adapted for planned

production and centralized control There can be few better There are some industries so simple and straightforward that Production Planning is hardly required, and there are others so varied and unusual in their products that detailed advance planning is almost impossible, but the airplane and engine industries come into neither of these classes The parts and operations in the manufacture of airplanes and of engines are so multitudinous that unplanned quantity production becomes an impossible chaos, and yet the designs of these parts are, or soon may be, so standardized that repetition, quantity production should be universal When such a condition has been reached, the question of cost-accounting becomes entirely secondary to that of production control Once determined, costs need not be figured again until some change occurs in the plan of production or the price of materials But when, due to error, spoilage, or other cause, the production-plan must be departed from, *then* the cost of this *departure* must be determined and allocated *according to its cause.*

If everything in production goes along 100%, no production costs whatever are required; they are what was planned and what they should be, but if production drops, as to 90%, then we are at once vitally interested in that 10% drop *while it is going on,* and we are more interested in its cause, so that we may correct it, than in its application to this, that, or the other article of production In fact, the latter is of comparatively little interest The cost of the error is not really an item of direct cost, at all An article is not worth a cent more because someone spoiled a part of it in manufacture The cost of spoilage and error is an item of profit and loss, or, at best, an element in the indirect cost of operating—the overhead—in the department causing the loss

Should Keep Careful Check

We should be more awake, much more so to the fact that spoilage is excessive in a certain process or department, than to the fact that some item of that spoilage happened to fall on one production-order or another These items of loss, with one other items of overhead which we cannot directly control, should be the objects of unremitting attention and study to see that they decrease to the lowest attainable amount We must know them as classes and items of expense, not bury them out of sight in our direct costs

Also there are in this, as in every industry, some necessary operations which it is not practicable to include directly in the production planning These, also, constitute elements of the Overhead, and means must be provided to determine them and cover them into the costs Indeed, the determining and controlling of Overhead is the most important and remaining duty of the cost-system.

It is now fairly obvious where the attention of the manufacturer must be directed, in this transition from the period of experiment and development to that of intensive, low-cost production. First and foremost is the question of Planning, which must cover the provision and maintenance of plant and equipment, the supply of necessary materials and services, determination of the best methods and standards, instruction of labor in these methods, and constant watchfulness to see that the schedules are not departed from Second, comes the question of Overhead, its determination and control Then those other contributory elements, under Marketing and Administration, must receive attention, though in the present condition of the industry they are of less vital importance than Production and Overhead Control

In succeeding articles each of these subjects will receive detailed attention.

SIDE SLIPS

By Robert R. Osborn

We trust we shall not be accused of the bad taste of finding anything humorous in the situations arising from the disaster which overtook the recent Arctic dirigible flight, but some of the dispatches and news concerning the flight and rescue attempts have had funny slants and breaks in them. B. H. of Cuba, Ill., for instance, writes in to complain that he thinks the rescue work is not being taken seriously, enclosing a clipping which states that "The powerful Russian ice breaker, Krassin, which rescued seven of the marooned crew of the Italia last week, was *forcing* its way toward Advent Bay today." Another item we found a while ago, which might explain the accident to one of the rescue airplanes which was damaged while attempting to land, stated that the pilot "taxied down to the ice" from a low altitude. Also, as a possible lead for placing the blame for the whole affair, there was an item in a New York paper a long while ago bearing the heading "Strong Southwest Wind Delays Nobile's Return Trip From Pole," which was printed alongside of a picture of Senator Blease, which had the subtitle "Talks For Six Hours."

* * *

In a recent accident, an airplane became uncontrollable and crashed through the roof of a barn. Mr. G. A. P. wants to know if this doesn't prove that the ship is "instable."

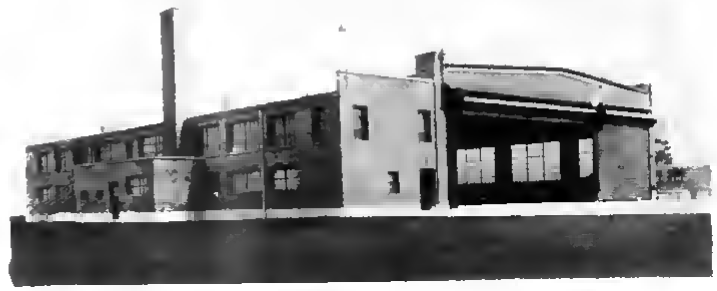
* * *

Mr. J. M. R. of San Francisco, Calif. encloses a lengthy clipping from a serial story running in a big local paper, with the suggestion that we add an "Authors" section to the Society for the Aeronautical Education of Artists and Newspaper Correspondents. The following short quotation from the story shows that his suggestion might well be taken: "The engine was turning over, sputtering a little. The spark plugs must be dirty. Then, one hand on the stick, she grasped the wheel and let the motor in gear. The plane swept down the beach."

Reading a little further along in the story we find that the ship fell in the water, so we assume the lady forgot to release the emergency brake.

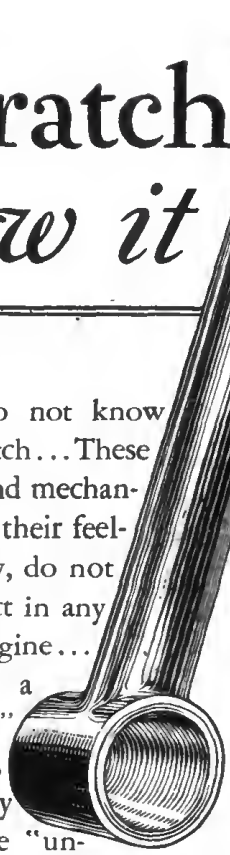
* * *

We should like to call the attention of the universities giving courses in aeronautical engineering to the advisability of including instruction in jig designing. A jig, we might explain, is a crude framework used to hold some particular piece of airplane structure, such as a wing, landing gear, or tail surface while sandbags are loaded on it to simulate the computed air loads and test its strength. It seems that nine out of ten of the reports of structural tests we read end with, "The tests were abandoned at this point because of the failure of the jig," or "The deflection could not be carried further as the jig interfered." We witnessed one test of an elevator recently, in which everything seemed to collapse suddenly and all of the sandbags fell on the floor. The engineers gleefully pounced on the heap to see what had failed, but after the load was removed nothing could be found as much as bent. The second loading collapsed the same way, still without a clue to the solution of the mystery. The third loading was half completed when a workman found a strut in the jig which folded up neatly under load and then snapped back in place when the sandbags were removed. The particular company making the tests is noted for the safety of its structures, but we'd hate to flight-test any of their jigs.



Ohio National Guard hangar at Cleveland, recently completed by Austin

A scratch means — "Throw it away!"



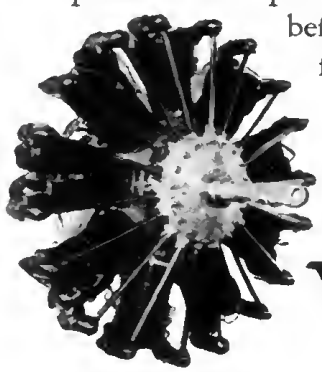
WRIGHT Workmen do not know how to "fix" a scratch... These men, whose high technical and mechanical skill is supplemented by their feeling of personal responsibility, do not know how to remedy a defect in any finished part for a Wright engine... Their only comment when a flaw is met is "throw it away"... A scratch however slight, a defect visible perhaps only through a microscope, is the "unlocked door" toward which stresses in the metal might strain for release.

That is why visitors to the Wright plant see discarded finished parts—to the average eye perfect in every detail—but to the searching eye of a Wright inspector unfit for service.

Nothing is left to chance in building Wright engines. Every operation is done by an expert in that individual field; every operation is inspected by another expert, before the completed, perfected and approved parts are accepted for assembly... There is no secret behind the performance of Wright engines. Every part in the Wright engine bears the Wright name. Every part in the Wright engine is as important as every other part. Every part in the Wright engine is the individual product of specialized workmen who know that the slightest departure from the highest standard may wreck the whole.

Every part in the Wright engine is sound, solid, tested and retested, made from the start to be tougher than the service it must give, and built from rough stock to assembly with full knowledge of its important function in the completed engine. Exactly what Wright engines will do is known.

For more than a decade Wright has been building engines with just such care as this... to produce aircraft power plants that measure up to the highest standard of excellence... an unchanging policy which explains Wright engine performance. That is why "more pilots fly them".



Wright "Cyclone" Aeronautical Engine

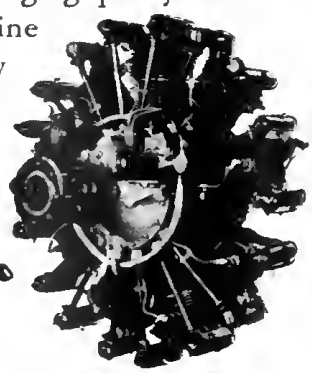
That's why *More Pilots fly them!*

WRIGHT

WRIGHT AERONAUTICAL CORPORATION

Paterson, N. J., U. S. A.

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal



Wright "Whirlwind" Aeronautical Engine

AUTHORIZED PARTS DEALERS

Air Associates Inc.—*Curtiss Field, Long Island, N. Y.* Pacific Aeromotive Corp.—*Los Angeles, Cal.* Stout Air Services, Inc.—*Dearborn, Mich.*